Mr. Jeff Loeffler
Waupaca Foundry, Inc.
P.O. Box 249
Waupaca, WI 54981

Re: PSD Significant Source Modification No:
123-12948-00019

Dear Mr. Loeffler:

Waupaca Foundry, Inc. applied for a Part 70 operating permit on November 20, 1997 for a gray and ductile iron foundry. An application to modify the source was received on May 31, 2000. Pursuant to 326 IAC 2-7-10.5 the following emission units are approved for construction at the source:

(a) One (1) new core making process, identified as P44, with a maximum capacity of 6 tons of cores per hour, including the following facilities:

(1) Two (2) core mixers, each with a maximum capacity of 3 tons of core sand per hour and 30.4 pounds of resin per ton of core, with emissions uncontrolled;

(2) Two (2) new Isocure phenolic urethane cold-box core machines, each with a maximum capacity of 3 tons of cores per hour and 3 pounds of triethylamine (TEA) catalyst per ton of core, with VOC emissions controlled by an acid scrubber (TEA scrubber), identified as C14, and exhausting through stack 14;

(b) One (1) existing core sand handling system, which is being modified to increase the capacity from 20 tons of core sand per hour to 26 tons of core sand per hour, with emissions controlled by an existing baghouse, which is also being upgraded. The baghouse flow rate will increase from 7,000 acfm to 14,000 acfm. The baghouse is identified as C08 and exhausts to stack S08.

The Significant Source Modification approval will be incorporated into the pending Part 70 permit application pursuant to 326 IAC 2-7-10.5(l)(3). If there are no changes to the proposed construction of the emission units, the source may begin operating on the date that IDEM receives an affidavit of construction pursuant to 326 IAC 2-7-10.5(h). If there are any changes to the proposed construction the source can not operate until an Operation Permit Validation Letter is issued.

This decision is subject to the Indiana Administrative Orders and Procedures Act - IC 4-21.5-3-5. If you have any questions on this matter call (800) 451-6027, press 0 and ask for Nisha Sizemore or extension 2-8356, or dial (317) 232-8356.

Sincerely,

Paul Dubenetzky, Chief
Permits Branch
Office of Air Quality

Attachments
nls
cc: File - Perry County
U.S. EPA, Region V
Perry County Health Department
Air Compliance Section Inspector - Richard Sekula
Compliance Data Section - Karen Nowak
Administrative and Development - Janet Mobley
Technical Support and Modeling - Michele Boner

NOTICE OF 30-DAY PERIOD
FOR PUBLIC COMMENT

Preliminary Findings Regarding a Part 70 Permit
Significant Source Modification

for Waupaca Foundry, Inc.
in Perry County

Part 70 No.: T123-9234-00019
Significant Source Modification No.: 123-12948

Notice is hereby given that the above-mentioned company, located at 9856 State Highway 66, Tell City, Indiana, 47586, has made application to the Indiana Department of Environmental Management (IDEM), Office of Air Quality (OAQ) for a Significant Source Modification to a Part 70 source for the construction of two new core machines, two new mixers, and modifications to increase the capacity of their existing core sand handling system.

The Significant Source Modification is being proposed under the provisions of the Prevention of Significant Deterioration (PSD) Program (40 CFR 52.21 and 326 IAC 2-2). The regulated pollutants above the PSD significant impact level include VOC, PM, PM10, lead, and beryllium. Therefore, a modeling analysis of these pollutants was performed to ensure that the proposed source does not violate the National Ambient Air Quality Standards (NAAQS) and does not exceed the incremental consumption above 80 percent of the PSD increment. The maximum PSD increments are established by 326 IAC 2-2 and limits a source to no more than 80 percent of the available PSD increment to allow for future growth.

Notice is hereby given that there will be a period of thirty (30) days from the date of publication of this notice during which any interested person may comment on why this proposed source modification should or should not be issued. Appropriate comments should be related to any air quality issues, interpretation of the state and federal rules, calculations made, technical issues, or the effect that the operation of this source would have on any aggrieved individuals. IDEM, OAQ does not have jurisdiction in specifying and implementing requirements for zoning, odor or noise. For such issues, please contact your local officials.

A copy of the application and draft source modification is available for examination at the Tell City - Perry County Public Library, 909 Franklin Street, Tell City, Indiana, 47586. A copy of the draft source modification is also available for examination at www.state.in.us/idem/oam/index.html. All statements, along with supporting documentation, should be submitted in writing to the IDEM, OAQ, 100 North Senate Avenue, P.O. Box 6015, Indianapolis, Indiana 46206-6015. If adverse comments concerning the **air pollution impact** of this draft source are received, together with a request for a public hearing, such a hearing may be held to give further consideration to this application.

Persons not wishing to comment at this time, but wishing to receive notice of future proceedings conducted related to this action, must submit a written request to the OAQ, at the above address. All interested parties of record will receive a notice of the decision on this matter and will then have fifteen (15) days after receipt of the Notice of Decision to file a petition for administrative review. Procedures for filing such a petition will be enclosed with the Notice.

Questions should be directed to Nisha Sizemore, OAQ, 100 North Senate Avenue, P.O. Box 6015, Indianapolis, Indiana, 46206-6015, or call (800) 451-6027, press 0 and ask for Nisha Sizemore or extension 2-8356, or dial (317) 232-8356.

Paul Dubenetzky, Chief
Permits Branch
Office of Air Quality

nls

PART 70 SIGNIFICANT SOURCE MODIFICATION, PSD
OFFICE OF AIR QUALITY

Waupaca Foundry, Inc.
9856 State Highway 66
Tell City, Indiana 47586

(herein known as the Permittee) is hereby authorized to construct and operate subject to the conditions contained herein, the emission units described in Section A (Source Summary) of this approval.

This approval is issued in accordance with 326 IAC 2 and 40 CFR Part 70 Appendix A and contains the conditions and provisions specified in 326 IAC 2-7 as required by 42 U.S.C. 7401, et. seq. (Clean Air Act as amended by the 1990 Clean Air Act Amendments), 40 CFR Part 70.6, IC 13-15 and IC 13-17.

PSD Source Modification No.: 123-12948-00019	
Issued by: Paul Dubenetzky, Branch Chief Office of Air Quality	Issuance Date:

TABLE OF CONTENTS

SECTION A SOURCE SUMMARY

This approval is based on information requested by the Indiana Department of Environmental Management (IDEM), Office of Air Quality (OAQ). The information describing the emission units contained in conditions A.1 through A.2 is descriptive information and does not constitute enforceable conditions. However, the Permittee should be aware that a physical change or a change in the method of operation that may render this descriptive information obsolete or inaccurate may trigger requirements for the Permittee to obtain additional permits or seek modification of this approval pursuant to 326 IAC 2, or change other applicable requirements presented in the permit application.

A.1 General Information [326 IAC 2-7-4(c)] [326 IAC 2-7-5(15)]

The Permittee owns and operates a stationary gray and ductile iron foundry.

Responsible Official:	James R. Larson, Vice President
Source Address:	9856 State Highway 66, Tell City, Indiana 47586
Mailing Address:	P.O. Box 249, Waupaca, Wisconsin 54981
SIC Code:	3321
County Location:	Perry
County Status:	Attainment for all criteria pollutants
Source Status:	Part 70 Permit Program Major Source under PSD Rules; Major Source, Section 112 of the Clean Air Act 1 of 28 listed source categories (secondary metal production)

A.2 Emission Units and Pollution Control Equipment Summary [326 IAC 2-7-4(c)(3)] [326 IAC 2-7-5(15)]

This stationary source is approved to construct and operate the following emission unit and pollution control device:

(a) One (1) new core making process, identified as P44, with a maximum capacity of 6 tons of cores per hour, including the following facilities:

(1) Two (2) core mixers, each with a maximum capacity of 3 tons of core sand per hour and 30.4 pounds of resin per ton of core, with emissions uncontrolled;

(2) Two (2) new Isocure phenolic urethane cold-box core machines, each with a maximum capacity of 3 tons of cores per hour and 3 pounds of triethylamine (TEA) catalyst per ton of core, with VOC emissions controlled by an acid scrubber (TEA scrubber), identified as C14, and exhausting through stack 14;

(b) One (1) existing core sand handling system, which is being modified to increase the capacity from 20 tons of core sand per hour to 26 tons of core sand per hour, with emissions controlled by an existing baghouse, which is also being upgraded. The baghouse flow rate will increase from 7,000 acfm to 14,000 acfm. The baghouse is identified as C08 and exhausts to stack S08.

(c) increased utilization of other existing processes at the plant due to the potential increase in production capacity as a direct result of this project. Emissions were calculated for increased utilization of the following existing facilities. No physical modifications are proposed for these facilities; therefore, pursuant to 40 CFR 52.21(i)(6) they do not have to comply with BACT.

(1) P33 - Phase 2 cupola;
(2) P35 - Ductile iron treatment stations;
(3) P60 - Line 5 pouring, mold cooling;

(4) P62 - Line 5 castings cooling;
(5) P61 - Line 5 shakeout;
(6) P63 - Line 5 pick and sort;
(7) P64 - Line 5 cleaning and grinding;
(8) P65 - Line 6 pouring, mold cooling;
(9) P62 - Line 6 castings cooling;
(10) P66 - Line 6 shakeout;
(11) P68 - Line 6 pick and sort;
(12) P69 - Line 6 cleaning and grinding;
(13) P70 - Line 7 pouring, mold cooling;
(14) P72 - Line 7 castings cooling;
(15) P71 - Line 7 shakeout;
(16) P73 - Line 7 pick and sort;
(17) P74 - Line 7 cleaning and grinding;
(18) P75 - Line 8 pouring, mold cooling;
(19) P77 - Line 8 castings cooling;
(20) P76 - Line 8 shakeout;
(21) P78 - Line 8 pick and sort;
(22) P79 - Line 8 cleaning and grinding;
(23) P80 - Return sand handling and screening;
(24) P81 - Sand mulling and handling;
(25) P82 - Sand blending and cooling;
(26) P83 - Spent sand and dust handling; and
(27) P84 - Metal returns handling.

A.3 Part 70 Permit Applicability [326 IAC 2-7-2]

This stationary source is required to have a Part 70 permit by 326 IAC 2-7-2 (Applicability) because:

(a) It is a major source, as defined in 326 IAC 2-7-1(22);

(b) It is a source in a source category designated by the United States Environmental Protection Agency (U.S. EPA) under 40 CFR 70.3 (Part 70 - Applicability).

SECTION B GENERAL CONSTRUCTION CONDITIONS

B.1 Definitions [326 IAC 2-7-1]

Terms in this permit shall have the definition assigned to such terms in the referenced regulation. In the absence of definitions in the referenced regulation, the applicable definitions found in the statutes or regulations (IC 13-11, 326 IAC 1-2 and 326 IAC 2-7) shall prevail.

B.2 Effective Date of the Permit [40CFR 124]

Pursuant to 40 CFR 124.15, 40 CFR 124.19, and 40 CFR 124.20, the permit is effective upon issuance.

B.3 Revocation of Permits [326 IAC 2-2-8]

Pursuant to 326 IAC 2-2-8(a)(1), this permit shall expire if construction is not commenced within eighteen (18) months after receipt of this approval or if construction is suspended for a continuous period of eighteen (18) months or more.

B.4 Significant Source Modification [326 IAC 2-7-10.5(h)]

This document shall also become the approval to operate pursuant to 326 IAC 2-7-10.5(h) when, prior to start of operation, the following requirements are met:

(a) The attached affidavit of construction shall be submitted to the Office of Air Quality (OAQ), Permit Administration & Development Section, verifying that the emission units were constructed as proposed in the application. The emissions units covered in the Significant Source Modification approval may begin operating on the date the affidavit of construction is postmarked or hand delivered to IDEM if constructed as proposed.

(b) If actual construction of the emissions units differs from the construction proposed in the application, the source may not begin operation until the source modification has been revised pursuant to 326 IAC 2-7-11 or 326 IAC 2-7-12 and an Operation Permit Validation Letter is issued.

(c) If construction is completed in phases; i.e., the entire construction is not done continuously, a separate affidavit must be submitted for each phase of construction. Any permit conditions associated with operation start up dates such as stack testing for New Source Performance Standards (NSPS) shall be applicable to each individual phase.

(d) The Permittee shall receive an Operation Permit Validation Letter from the Chief of the Permit Administration & Development Section and attach it to this document.

(e) In the event that the Part 70 application is being processed at the same time as this application, the following additional procedures shall be followed for obtaining the right to operate:

(1) If the Part 70 draft permit has not gone on public notice, then the change/addition covered by the Significant Source Modification will be included in the Part 70 draft.

(2) If the Part 70 permit has gone through final EPA proposal and would be issued ahead of the Significant Source Modification, the Significant Source Modification will go through a concurrent 45 day EPA review. Then the Significant Source Modification will be incorporated into the final Part 70 permit at the time of issuance.

(3) If the Part 70 permit has gone through public notice, but has not gone through final EPA review and would be issued after the Significant Source Modification is issued, then the Modification would be added to the proposed Part 70 permit, and the Title V permit will issued after EPA review.

SECTION C GENERAL OPERATION CONDITIONS

C.1 Certification [326 IAC 2-7-4(f)][326 IAC 2-7-6(1)][326 IAC 2-7-5(3)(C)]

(a) Where specifically designated by this permit or required by an applicable requirement, any application form, report, or compliance certification submitted shall contain certification by a responsible official of truth, accuracy, and completeness. This certification shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

(b) One (1) certification shall be included, using the attached Certification Form, with each submittal requiring certification.

(c) A responsible official is defined at 326 IAC 2-7-1(34).

C.2 Preventive Maintenance Plan [326 IAC 2-7-5(1),(3) and (13)] [326 IAC 2-7-6(1) and (6)] [326 IAC 1-6-3]

(a) If required by specific condition(s) in Section D of this permit, the Permittee shall prepare and maintain Preventive Maintenance Plans (PMPs) when operation begins, including the following information on each facility:

(1) Identification of the individual(s) responsible for inspecting, maintaining, and repairing emission control devices;

(2) A description of the items or conditions that will be inspected and the inspection schedule for said items or conditions; and

(3) Identification and quantification of the replacement parts that will be maintained in inventory for quick replacement.

If, due to circumstances beyond the Permittee's control, the PMPs cannot be prepared and maintained within the above time frame, the Permittee may extend the date an additional ninety (90) days provided the Permittee notifies:

Indiana Department of Environmental Management
Compliance Branch, Office of Air Quality
100 North Senate Avenue, P. O. Box 6015
Indianapolis, Indiana 46206-6015

The PMP and the PMP extension notification do not require the certification by the "responsible official" as defined by 326 IAC 2-7-1(34).

(b) The Permittee shall implement the PMPs as necessary to ensure that failure to implement a PMP does not cause or contribute to a violation of any limitation on emissions or potential to emit.

(c) A copy of the PMPs shall be submitted to IDEM, OAQ, upon request and within a reasonable time, and shall be subject to review and approval by IDEM, OAQ. IDEM, OAQ, may require the Permittee to revise its PMPs whenever lack of proper maintenance causes or contributes to any violation. The PMP does not require the certification by the "responsible official" as defined by 326 IAC 2-7-1(34).

(d) Records of preventive maintenance shall be retained for a period of at least five (5) years.

These records shall be kept at the source location for a minimum of three (3) years. The records may be stored elsewhere for the remaining two (2) years as long as they are available upon request. If the Commissioner makes a request for records to the Permittee, the Permittee shall furnish the records to the Commissioner within a reasonable time.

C.3 Permit Amendment or Modification [326 IAC 2-7-11] [326 IAC 2-7-12]

(a) Permit amendments and modifications are governed by the requirements of 326 IAC 2-7-11 or 326 IAC 2-7-12 whenever the Permittee seeks to amend or modify this permit.

(b) Any application requesting an amendment or modification of this permit shall be submitted to:

Indiana Department of Environmental Management
Permits Branch, Office of Air Quality
100 North Senate Avenue, P.O. Box 6015
Indianapolis, Indiana 46206-6015

Any such application shall be certified by the "responsible official" as defined by 326 IAC 2-7-1(34).

(c) The Permittee may implement administrative amendment changes addressed in the request for an administrative amendment immediately upon submittal of the request. [326 IAC 2-7-11(c)(3)]

C.4 Opacity [326 IAC 5-1]

Pursuant to 326 IAC 5-1-2 (Opacity Limitations), except as provided in 326 IAC 5-1-3 (Temporary Alternative Opacity Limitations), opacity shall meet the following, unless otherwise stated in this permit:

(a) Opacity shall not exceed an average of forty percent (40%) in any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.

(b) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of fifteen (15) minutes (sixty (60) readings as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor) in a six (6) hour period.

C.5 Fugitive Dust Emissions [326 IAC 6-4]

The Permittee shall not allow fugitive dust to escape beyond the property line or boundaries of the property, right-of-way, or easement on which the source is located, in a manner that would violate 326 IAC 6-4 (Fugitive Dust Emissions). 326 IAC 6-4-2(4) is not federally enforceable.

C.6 Operation of Equipment [326 IAC 2-7-6(6)]

Except as otherwise provided by statute or rule, or in this permit, all air pollution control equipment listed in this permit and used to comply with an applicable requirement shall be operated at all times that the emission units vented to the control equipment are in operation.

Testing Requirements [326 IAC 2-7-6(1)]

C.7 Performance Testing [326 IAC 3-6][326 IAC 2-1.1-11]

(a) Compliance testing on new emission units shall be conducted within 60 days after achieving maximum production rate, but no later than 180 days after initial start-up, if specified in

Section D of this approval. All testing shall be performed according to the provisions of 326 IAC 3-6 (Source Sampling Procedures), except as provided elsewhere in this approval, utilizing any applicable procedures and analysis methods specified in 40 CFR 51, 40 CFR 60, 40 CFR 61, 40 CFR 63, 40 CFR 75, or other procedures approved by IDEM, OAQ.

A test protocol, except as provided elsewhere in this approval, shall be submitted to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Quality
100 North Senate Avenue, P. O. Box 6015
Indianapolis, Indiana 46206-6015

no later than thirty-five (35) days prior to the intended test date. The protocol submitted by the Permittee does not require certification by the "responsible official" as defined by 326 IAC 2-7-1(34).

(b) The Permittee shall notify IDEM, OAQ of the actual test date at least fourteen (14) days prior to the actual test date. The notification submitted by the Permittee does not require certification by the "responsible official" as defined by 326 IAC 2-7-1(34).

(c) Pursuant to 326 IAC 3-6-4(b), all test reports must be received by IDEM, OAQ within forty-five (45) days after the completion of the testing. An extension may be granted by IDEM, OAQ, if the source submits to IDEM, OAQ, a reasonable written explanation within five (5) days prior to the end of the initial forty-five (45) day period.

Compliance Requirements [326 IAC 2-1.1-11]

C.8 Compliance Requirements [326 IAC 2-1.1-11]

The commissioner may require stack testing, monitoring, or reporting at any time to assure compliance with all applicable requirements. Any monitoring or testing shall be performed in accordance with 326 IAC 3 or other methods approved by the commissioner or the U. S. EPA.

Compliance Monitoring Requirements [326 IAC 2-7-5(1)] [326 IAC 2-7-6(1)]

C.9 Compliance Monitoring [326 IAC 2-7-5(3)] [326 IAC 2-7-6(1)]

If required by Section D, all monitoring and record keeping requirements shall be implemented when operation begins. The Permittee shall be responsible for installing any necessary equipment and initiating any required monitoring related to that equipment.

C.10 Maintenance of Emission Monitoring Equipment [326 IAC 2-7-5(3)(A)(iii)]

(a) In the event that a breakdown of the emission monitoring equipment occurs, a record shall be made of the times and reasons of the breakdown and efforts made to correct the problem. To the extent practicable, supplemental or intermittent monitoring of the parameter should be implemented at intervals no less frequent than required in Section D of this permit until such time as the monitoring equipment is back in operation. In the case of continuous monitoring, supplemental or intermittent monitoring of the parameter should be implemented at intervals no less often than once an hour until such time as the continuous monitor is back in operation.

(b) The Permittee shall install, calibrate, quality assure, maintain, and operate all necessary monitors and related equipment. In addition, prompt corrective action shall be initiated

whenever indicated.

C.11 Pressure Gauge and Other Instrument Specifications [326 IAC 2-1.1-11] [326 IAC 2-7-5(3)] [326 IAC 2-7-6(1)]

(a) Whenever a condition in this permit requires the measurement of pressure drop across any part of the unit or its control device, the gauge employed shall have a scale such that the expected normal reading shall be no less than twenty percent (20%) of full scale and be accurate within plus or minus two percent (±2%) of full scale reading.

(b) Whenever a condition in this permit requires the measurement of a temperature, flow rate, or pH level), the instrument employed shall have a scale such that the expected normal reading shall be no less than twenty percent (20%) of full scale and be accurate within plus or minus two percent (±2%) of full scale reading.

(c) The Permittee may request the IDEM, OAQ approve the use of a pressure gauge or other instrument that does not meet the above specifications provided the Permittee can demonstrate an alternative pressure gauge or other instrument specification will adequately ensure compliance with permit conditions requiring the measurement of pressure drop or other parameters.

Corrective Actions and Response Steps [326 IAC 2-7-5] [326 IAC 2-7-6]

C.12 Compliance Monitoring Plan - Failure to Take Response Steps [326 IAC 2-7-5] [326 IAC 2-7-6]

(a) The Permittee is required to implement a compliance monitoring plan to ensure that reasonable information is available to evaluate its continuous compliance with applicable requirements. The compliance monitoring plan can be either an entirely new document, consist in whole of information contained in other documents, or consist of a combination of new information and information contained in other documents. If the compliance monitoring plan incorporates by reference information contained in other documents, the Permittee shall identify as part of the compliance monitoring plan the documents in which the information is found. The elements of the compliance monitoring plan are:

(1) This condition;

(2) The Compliance Determination Requirements in Section D of this permit;

(3) The Compliance Monitoring Requirements in Section D of this permit;

(4) The Record Keeping and Reporting Requirements in Section C (General Record Keeping Requirements, and General Reporting Requirements) and in Section D of this permit; and

(5) A Compliance Response Plan (CRP) for each compliance monitoring condition of this permit. CRP's shall be submitted to IDEM, OAQ upon request and shall be subject to review and approval by IDEM, OAQ. The CRP shall be prepared within ninety (90) days after issuance of this permit by the Permittee and maintained on site, and is comprised of:

(A) Reasonable response steps that may be implemented in the event that compliance related information indicates that a response step is needed pursuant to the requirements of Section D of this permit; and

(B) A time schedule for taking reasonable response steps including a schedule for devising additional response steps for situations that may not have been predicted.

(b) For each compliance monitoring condition of this permit, reasonable response steps shall be taken when indicated by the provisions of that compliance monitoring condition. Failure to take reasonable response steps may constitute a violation of the permit.

(c) Upon investigation of a compliance monitoring excursion, the Permittee is excused from taking further response steps for any of the following reasons:

(1) A false reading occurs due to the malfunction of the monitoring equipment. This shall be an excuse from taking further response steps providing that prompt action was taken to correct the monitoring equipment.

(2) The Permittee has determined that the compliance monitoring parameters established in the permit conditions are technically inappropriate, has previously submitted a request for an administrative amendment to the permit, and such request has not been denied.

(3) An automatic measurement was taken when the process was not operating.

(4) The process has already returned or is returning to operating within "normal" parameters and no response steps are required.

(d) Records shall be kept of all instances in which the compliance related information was not met and of all response steps taken. In the event of an emergency, the provisions of 326 IAC 2-7-16 (Emergency Provisions) requiring prompt corrective action to mitigate emissions shall prevail.

(e) All monitoring required in Section D shall be performed at all times the equipment is operating. If monitoring is required by Section D and the equipment is not operating, then the Permittee may record the fact that the equipment is not operating or perform the required monitoring.

(f) At its discretion, IDEM may excuse the Permittee's failure to perform the monitoring and record keeping as required by Section D, if the Permittee provides adequate justification and documents that such failures do not exceed five percent (5%) of the operating time in any quarter. Temporary, unscheduled unavailability of qualified staff shall be considered a valid reason for failure to perform the monitoring or record keeping requirements in Section D.

C.13 Emergency Provisions [326 IAC 2-7-16]

(a) An emergency, as defined in 326 IAC 2-7-1(12), is not an affirmative defense for an action brought for noncompliance with a federal or state health-based emission limitation, except as provided in 326 IAC 2-7-16.

(b) An emergency, as defined in 326 IAC 2-7-1(12), constitutes an affirmative defense to an action brought for noncompliance with a health-based or technology-based emission limitation if the affirmative defense of an emergency is demonstrated through properly signed, contemporaneous operating logs or other relevant evidence that describe the following:

(1) An emergency occurred and the Permittee can, to the extent possible, identify the causes of the emergency;

(2) The permitted facility was at the time being properly operated;

(3) During the period of an emergency, the Permittee took all reasonable steps to minimize levels of emissions that exceeded the emission standards or other requirements in this permit;

(4) For each emergency lasting one (1) hour or more, the Permittee notified IDEM, OAQ, within four (4) daytime business hours after the beginning of the emergency, or after the emergency was discovered or reasonably should have been discovered;

Telephone Number: 1-800-451-6027 (ask for Office of Air Quality, Compliance Section), or
Telephone Number: 317-233-5674 (ask for Compliance Section)
Facsimile Number: 317-233-5967

(5) For each emergency lasting one (1) hour or more, the Permittee submitted the attached Emergency Occurrence Report Form or its equivalent, either by mail or facsimile to:

Indiana Department of Environmental Management
Compliance Branch, Office of Air Quality
100 North Senate Avenue, P. O. Box 6015
Indianapolis, Indiana 46206-6015

within two (2) working days of the time when emission limitations were exceeded due to the emergency.

The notice fulfills the requirement of 326 IAC 2-7-5(3)(C)(ii) and must contain the following:

(A) A description of the emergency;

(B) Any steps taken to mitigate the emissions; and

(C) Corrective actions taken.

The notification which shall be submitted by the Permittee does not require the certification by the “responsible official” as defined by 326 IAC 2-7-1(34).

(6) The Permittee immediately took all reasonable steps to correct the emergency.

(c) In any enforcement proceeding, the Permittee seeking to establish the occurrence of an emergency has the burden of proof.

(d) This emergency provision supersedes 326 IAC 1-6 (Malfunctions). This permit condition is in addition to any emergency or upset provision contained in any applicable requirement.

(e) IDEM, OAQ, may require that the Preventive Maintenance Plans required under 326 IAC 2-7-4-(c)(10) be revised in response to an emergency.

(f) Failure to notify IDEM, OAQ, by telephone or facsimile of an emergency lasting more than one (1) hour in accordance with (b)(4) and (5) of this condition shall constitute a violation of 326 IAC 2-7 and any other applicable rules.

(g) Operations may continue during an emergency only if the following conditions are met:

(1) If the emergency situation causes a deviation from a technology-based limit, the Permittee may continue to operate the affected emitting facilities during the emergency provided the Permittee immediately takes all reasonable steps to correct the emergency and minimize emissions.

(2) If an emergency situation causes a deviation from a health-based limit, the Permittee may not continue to operate the affected emissions facilities unless:

(A) The Permittee immediately takes all reasonable steps to correct the emergency situation and to minimize emissions; and

(B) Continued operation of the facilities is necessary to prevent imminent injury to persons, severe damage to equipment, substantial loss of capital investment, or loss of product or raw materials of substantial economic value.

Any operation shall continue no longer than the minimum time required to prevent the situations identified in (g)(2)(B) of this condition.

C.14 Actions Related to Noncompliance Demonstrated by a Stack Test [326 IAC 2-7-5] [326 IAC 2-7-6]

(a) When the results of a stack test performed in conformance with Section C - Performance Testing, of this permit exceed the level specified in any condition of this permit, the Permittee shall take appropriate response actions. The Permittee shall submit a description of these response actions to IDEM, OAQ, within thirty (30) days of receipt of the test results. The Permittee shall take appropriate action to minimize excess emissions from the affected facility while the response actions are being implemented.

(b) A retest to demonstrate compliance shall be performed within one hundred twenty (120) days of receipt of the original test results. Should the Permittee demonstrate to IDEM, OAQ that retesting in one-hundred and twenty (120) days is not practicable, IDEM, OAQ may extend the retesting deadline.

(c) IDEM, OAQ reserves the authority to take any actions allowed under law in response to noncompliant stack tests.

The documents submitted pursuant to this condition do not require the certification by the "responsible official" as defined by 326 IAC 2-7-1(34).

Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]

C.15 General Record Keeping Requirements [326 IAC 2-7-5(3)][326 IAC 2-7-6]

(a) Records of all required data, reports and support information shall be retained for a period of at least five (5) years from the date of monitoring sample, measurement, report, or application. These records shall be kept at the source location for a minimum of three (3) years. The records may be stored elsewhere for the remaining two (2) years as long as

they are available upon request. If the Commissioner makes a request for records to the Permittee, the Permittee shall furnish the records to the Commissioner within a reasonable time.

(b) Unless otherwise specified in this permit, all record keeping requirements not already legally required shall be implemented within ninety (90) days of permit issuance.

C.16 General Reporting Requirements [326 IAC 2-7-5(3)(C)]

(a) The reports required by conditions in Section D of this permit shall be submitted to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Quality
100 North Senate Avenue, P. O. Box 6015
Indianapolis, Indiana 46206-6015

(b) Unless otherwise specified in this permit, any notice, report, or other submission required by this permit shall be considered timely if the date postmarked on the envelope or certified mail receipt, or affixed by the shipper on the private shipping receipt, is on or before the date it is due. If the document is submitted by any other means, it shall be considered timely if received by IDEM, OAQ, on or before the date it is due.

(c) Unless otherwise specified in this permit, all reports required in Section D of this permit shall be submitted within thirty (30) days of the end of the reporting period. All reports do require the certification by the “responsible official” as defined by 326 IAC 2-7-1(34).

(d) The first report shall cover the period commencing on the date of issuance of this permit and ending on the last day of the reporting period. Reporting periods are based on calendar years.

SECTION D.1 FACILITY OPERATION CONDITIONS

Facility Description [326 IAC 2-7-5(15)]

One (1) existing core sand handling system, which is being modified to increase the capacity from 20 tons of core sand per hour to 26 tons of core sand per hour, with emissions controlled by an existing baghouse, which is also being upgraded. The baghouse flow rate will increase from 7,000 acfm to 14,000 acfm. The baghouse is identified as C08 and exhausts to stack S08.

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

Emission Limitations and Standards [326 IAC 2-7-5(1)]

D.1.1 Particulate Matter (PM) [326 IAC 6-3-2]

Pursuant to 326 IAC 6-3-2 (Process Operations), the allowable PM emission rate from the core sand handling system identified as P42 shall not exceed 36.4 pounds per hour when operating at a process weight rate of 26 tons of sand per hour. The pounds per hour limitation was calculated using the following equation:

Interpolation of the data for the process weight rate up to 60,000 pounds per hour shall be accomplished by use of the equation:

$E = 4.10\ P^{0.67}$ where E = rate of emission in pounds per hour; and
P = process weight rate in tons per hour

D.1.2 BACT for PM/PM10

The Permittee shall comply with the following BACT requirements.

(a) Pursuant to 326 IAC 2-2-3(a)(3) (Prevention of Significant Deterioration (PSD) Rules), the PM/PM10 emissions from the baghouse C08 controlling core sand handling system P42 shall be limited to 0.005 grains per dry standard cubic foot of exhaust air and 34.3 pounds per hour. Compliance with this limit will also satisfy the requirements of Condition D.1.1.

(b) The core sand handling system, identified as P42, shall be limited to a maximum throughput capacity of 26 tons of sand per hour. This requirement shall supersede Condition D.2.4(a) of CP123-8451 issued February 4, 1998.

D.1.3 Preventive Maintenance Plan [326 IAC 2-7-5(13)]

A Preventive Maintenance Plan, in accordance with Section B - Preventive Maintenance Plan, of this permit, is required for the core sand handling system P42 and baghouse C08.

Compliance Determination Requirements

D.1.4 Particulate Matter (PM)

In order to comply with D.1.1 and D.1.2, the baghouse C08 for particulate control shall be in operation and control emissions from the core sand handling system P42 at all times that the core sand handling system P42 is in operation.

D.1.5 Testing Requirements [326 IAC 2-7-6(1),(6)] [326 IAC 2-1.1-11]

Within 60 days after achieving maximum production rate, but no later than 180 days after initial start-up the Permittee shall perform PM and PM10 testing from baghouse C08 using methods as

approved by the Commissioner, in order to demonstrate compliance with conditions D.1.1 and D.1.2. Any stack which has multiple processes which exhaust to the same stack shall operate all of the processes simultaneously in accordance with 326 IAC 3-2.1 (Source Sampling Procedures). PM10 includes filterable and condensible PM10. These tests shall be repeated at least once every five (5) years from the date of this valid compliance demonstration. Testing shall be conducted in accordance with Section C - Performance Testing.

Compliance Monitoring Requirements [326 IAC 2-7-6(1)] [326 IAC 2-7-5(1)]

D.1.6 Visible Emissions Notations

(a) Visible emission notations of the baghouse C08 stack exhaust shall be performed once per shift during normal daylight operations when exhausting to the atmosphere. A trained employee shall record whether emissions are normal or abnormal.

(b) For processes operated continuously, "normal" means those conditions prevailing, or expected to prevail, eighty percent (80%) of the time the process is in operation, not counting startup or shut down time.

(c) In the case of batch or discontinuous operations, readings shall be taken during that part of the operation that would normally be expected to cause the greatest emissions.

(d) A trained employee is an employee who has worked at the plant at least one (1) month and has been trained in the appearance and characteristics of normal visible emissions for that specific process.

(e) The Compliance Response Plan for this unit shall contain troubleshooting contingency and response steps for when an abnormal emission is observed. Failure to take response steps in accordance with Section C - Compliance Monitoring Plan - Failure to Take Response Steps, shall be considered a violation of this permit.

D.1.7 Parametric Monitoring

The Permittee shall record the total static pressure drop across the baghouse used in conjunction with the core sand handling system P42, at least once per shift when the core sand handling system P42 is in operation when venting to the atmosphere. Unless operated under conditions for which the Compliance Response Plan specifies otherwise, the pressure drop across the baghouse shall be maintained within the range of 1 and 4 inches of water or a range established during the latest stack test. The Compliance Response Plan for this unit shall contain troubleshooting contingency and response steps for when the pressure reading is outside of the above mentioned range for any one reading. Failure to take response steps in accordance with Section C - Compliance Monitoring Plan - Failure to Take Response Steps, shall be considered a violation of this permit.

The instrument used for determining the pressure shall comply with Section C - Pressure Gauge and Other Instrument Specifications, of this permit, shall be subject to approval by IDEM, OAQ, and shall be calibrated at least once every six (6) months.

D.1.8 Baghouse Inspections

An inspection shall be performed each calender quarter of all bags controlling the core sand handling system P42 when the ventilation system is configured to vent to the atmosphere. A baghouse inspection shall be performed within three months of redirecting vents to the atmosphere and every three months thereafter. Inspections are optional when venting to the indoors. All defective bags shall be replaced.

D.1.9 Broken or Failed Bag Detection

In the event that bag failure has been observed:

(a) For multi-compartment units, the affected compartments will be shut down immediately until the failed units have been repaired or replaced. Operations may continue only if there are no visible emissions or if the event qualifies as an emergency and the Permittee satisfies the emergency provisions of this permit (Section B- Emergency Provisions). Within eight (8) business hours of the determination of failure, response steps according to the timetable described in the Compliance Response Plan shall be initiated. For any failure with corresponding response steps and timetable not described in the Compliance Response Plan, response steps shall be devised within eight (8) business hours of discovery of the failure and shall include a timetable for completion. Failure to take response steps in accordance with Section C - Compliance Monitoring Plan - Failure to Take Response Steps, shall be considered a violation of this permit.

(b) For single compartment baghouses, failed units and the associated process will be shut down immediately until the failed units have been repaired or replaced. Operations may continue only if the event qualifies as an emergency and the Permittee satisfies the requirements of the emergency provisions of this permit (Section B - Emergency Provisions).

Record Keeping and Reporting Requirement [326 IAC 2-7-5(3)] [326 IAC 2-7-19]

D.1.10 Record Keeping Requirements

(a) To document compliance with Condition D.1.6, the Permittee shall maintain records of visible emission notations of the baghouse C08 stack exhaust once per shift.

(b) To document compliance with Condition D.1.7, the Permittee shall maintain once per shift records of the following operational parameters during normal operation when venting to the atmosphere:

(1) inlet and outlet differential static pressure; and

(2) whether or not the cleaning cycle operations were functioning normally during each shift.

(c) To document compliance with Condition D.1.8, the Permittee shall maintain records of the results of the inspections required under Condition D.1.8 and any dates the baghouse exhaust is changed from indoors to outdoors, and from the outdoors to the indoors.

(d) All records shall be maintained in accordance with Section C - General Record Keeping Requirements, of this permit.

SECTION D.2 FACILITY OPERATION CONDITIONS

Facility Description [326 IAC 2-7-5(15)]

One (1) new core making process, identified as P44, with a maximum capacity of 6 tons of cores per hour, including the following facilities:

(1) Two (2) core mixers, each with a maximum capacity of 3 tons of core sand per hour and 30.4 pounds of resin per ton of core, with emissions uncontrolled;

(2) Two (2) new Isocure phenolic urethane cold-box core machines, each with a maximum capacity of 3 tons of cores per hour and 3 pounds of triethylamine (TEA) catalyst per ton of core, with VOC emissions controlled by an acid scrubber (TEA scrubber), identified as C14, and exhausting through stack 14;

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

Emission Limitations and Standards [326 IAC 2-7-5(1)] [326 IAC 2-2-3(a)(3)] [326 IAC 2-4.1-1]

D.2.1 Volatile Organic Compound Emission Limitations [326 IAC 2-2-3(a)(3)][326 IAC 2-2-3(a)(3)] [326 IAC 8-1-6]

Pursuant to 326 IAC 2-2-3(a)(3) (PSD BACT), 326 IAC 8-1-6 (BACT), and 326 IAC 2-4.1-1 (New Source Toxics Control), the following limitations shall apply:

(a) The non-TEA volatile organic compound (VOC) emissions from both of the phenolic-urethane core machines, identified as P44, shall not exceed 1.836 pounds per hour (total for both machines combined) and 0.010 pounds per pound of binder used. The Department may revise this permit to adjust the non-TEA VOC limitation based upon the results of the stack test required in Condition D.2.6. The Department will provide an opportunity for public notice and comment prior to finalizing any permit revision. IC 13-15-7-3 (Revocation or Modification of a Permit: Appeal to Board) shall apply to this permit condition.

(b) The volatile organic compound (VOC) emissions from both of the mixers, identified as P44, shall not exceed 0.324 pounds per hour (total for both mixers combined) and 0.002 pounds per pound of binder used. The Department may revise this permit to adjust the VOC limitation based upon the results of the stack test required in Condition D.2.6. The Department will provide an opportunity for public notice and comment prior to finalizing any permit revision. IC 13-15-7-3 (Revocation or Modification of a Permit: Appeal to Board) shall apply to this permit condition.

(c) The amount of binder used in both mixers combined shall not exceed 390 tons per 12 consecutive month period. For the first 12 months of operation, the limit shall be 32.5 tons per month.

(d) The amount of cores produced by both core machines combined shall not exceed 26,000 tons per 12 consecutive month period. For the first 12 months of operation, the limit shall be 2,167 tons per month.

D.2.2 Hazardous Air Pollutant Emission Limitations [326 IAC 2-2-3(a)(3)] [326 IAC 2-2-3(a)(3)]

Pursuant to 326 IAC 2-2-3(a)(3) (PSD BACT) and in order to render the requirements of 326 IAC 2-

4.1-1 (New Source Toxics Control) not applicable, the following limitations shall apply to the two new core machines, both identified as P44:

(a) The triethylamine (TEA) emissions from the core making process shall be limited to 0.36 pounds per hour and 0.06 pounds per ton of cores.

(b) The scrubber shall be operated at all times and achieve a 100% capture of the TEA emissions using a Permanent Total Enclosure, which complies with the requirements of 40 CFR Part 51, Appendix M, Method 204.

(c) The scrubber shall achieve a minimum control efficiency of 98% for TEA.

Therefore the requirements of 326 IAC 2-4.1-1 (New Source Toxics Control) shall not apply.

D.2.3 Operation Standards

Pursuant to 326 IAC 2-2-3(a)(3), the phenolic-urethane core making process, identified as P44, shall be limited to a maximum production capacity of 6 tons of cores per hour.

D.2.4 Preventive Maintenance Plan [326 IAC 2-7-5(13)]

A Preventive Maintenance Plan, in accordance with Section B - Preventive Maintenance Plan, of this permit, is required for the TEA scrubber.

Compliance Determination

D.2.5 Scrubber Operating Requirements

The scrubber shall be operated and control TEA emissions at the core machines at all times when either core machine is in operation to demonstrate compliance with Operation Condition D.2.2.

D.2.6 Testing Requirements [326 IAC 2-7-6(1),(6)]

Within 60 days after achieving maximum production but no later than 180 days after startup, the Permittee shall perform VOC testing on the Isocure core mixers and core machines in order to demonstrate compliance with Conditions D.2.1(a) and (b). The Permittee shall also perform TEA testing on the scrubber controlling the Isocure core machines in order to demonstrate compliance with Condition D.2.2(a), (b), and (c). These tests shall be performed using methods as approved by the Commissioner. The capture and control efficiencies of the scrubber shall be measured during the compliance test. The capture efficiency shall be measured using the procedures listed under 40 CFR Part 51, Appendix M, Method 204. These tests shall be repeated at least once every five (5) years from the date of this valid compliance demonstration. Testing shall be conducted in accordance with Section C - Performance Testing.

Compliance Monitoring Requirements [326 IAC 2-7-6(1)] [326 IAC 2-7-5(1)]

D.2.7 Packed Bed Scrubber Monitoring

(a) The Permittee shall monitor and record the pH of the scrubber solution and the pressure drop across the scrubber unit at least once per shift. Unless operated under conditions for which the Compliance Response Plan specifies otherwise, the pressure drop across the scrubber shall be maintained within the range of 2 to 5 inches of water or a range established during the latest stack test. Unless operated under conditions for which the Compliance Response Plan specifies otherwise, the pH level of the scrubbing liquid shall not exceed 4.5 or a maximum established during the latest stack test. The Compliance Response Plan for the scrubber shall contain troubleshooting contingency and response steps for when the pressure drop reading is outside of the normal range for any one reading

or the pH level is above the normal maximum for any one reading. Failure to take response steps in accordance with Section C - Compliance Monitoring Plan - Failure to Take Response Steps, shall be considered a violation of this permit. These requirements supersede Condition D.2.7(a) of CP123-8451 issued February 4, 1998.

(b) The Permittee shall continuously monitor the flow rate of the scrubbing liquid. Unless operated under conditions for which the Compliance Response Plan specifies otherwise, the flow rate shall be maintained at a minimum of 235 gallons per minute or a minimum established during the latest stack test. The Compliance Response Plan for the scrubber shall contain troubleshooting contingency and response steps for when the flow rate reading is below the normal minimum for any one reading. Failure to take response steps in accordance with Section C - Compliance Monitoring Plan - Failure to Take Response Steps, shall be considered a violation of this permit.

(c) The instruments used for determining the pressure, flow rate, and pH level shall comply with Section C - Pressure Gauge and Other Instrument Specifications, of this permit, shall be subject to approval by IDEM, OAQ, and shall be calibrated at least once every six (6) months.

D.2.8 Scrubber Inspections

An inspection shall be performed each calender quarter of the scrubber controlling the core machines. All defective scrubber parts shall be replaced.

D.2.9 Scrubber Failure

In the event that scrubber failure has been observed:

(a) The affected process will be shut down immediately until the failed unit has been replaced. Failure to take response steps in accordance with Section C - Compliance Monitoring Plan - Failure to Take Response Steps, shall be considered a violation of this permit.

(b) Within eight (8) hours of the determination of failure, response steps according to the timetable described in the Compliance Response Plan shall be initiated. For any failure with corresponding response steps and timetable not described in the Compliance Response Plan, response steps shall be devised within eight (8) hours of discovery of the failure and shall include a timetable for completion.

Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]

D.2.10 Record Keeping Requirements

(a) To document compliance with Condition D.2.1(c), the Permittee shall maintain records of the binder usage in the two core mixers associated with the core making process identified as P44 each month.

(b) To document compliance with Condition D.2.1(d), the Permittee shall maintain records of the core production from the two core machines associated with the core making process identified as P44 each month.

(c) To document compliance with Condition D.2.7(a), the Permittee shall maintain records of the pressure drop and pH readings of the scrubber once per shift.

(d) To document compliance with Condition D.2.7(b), the Permittee shall maintain records of

the flow rate of the scrubber.

(e) To document compliance with Conditions D.2.8, the Permittee shall maintain records of the results of the inspections required under Conditions D.2.8 and the number and type of any parts replaced.

(f) All records shall be maintained in accordance with Section C - General Record Keeping Requirements, of this permit.

D.2.11 Reporting Requirements

A quarterly summary of the information to document compliance with Conditions D.2.1(c) and (d) shall be submitted to the address listed in Section C - General Reporting Requirements, using the reporting forms located at the end of this permit, or their equivalent, within thirty (30) days after the end of the quarter being reported.

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
COMPLIANCE DATA SECTION

PART 70 SOURCE MODIFICATION CERTIFICATION

Source Name: Waupaca Foundry, Inc.
Source Address: 9856 State Highway 66, Tell City, Indiana 47586
Mailing Address: P.O. Box 249, Waupaca Wisconsin 54981
Source Modification No.: 123-12948-00019

This certification shall be included when submitting monitoring, testing reports/results or other documents as required by this approval.

Please check what document is being certified:

9 Test Result (specify) _____

9 Report (specify) _____

9 Notification (specify) _____

9 Affidavit (specify) _____

9 Other (specify) _____

I certify that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

Signature:

Printed Name:

Title/Position:

Date:

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
COMPLIANCE DATA SECTION

Part 70 Source Modification Quarterly Report

Source Name:	Waupaca Foundry, Inc.
Source Address:	9856 State Highway 66, Tell City, Indiana 47586
Mailing Address:	P.O. Box 249, Waupaca Wisconsin 54981
Source Modification No.:	123-12948-00019
Facility:	Two (2) Isocure core machines identified as P44
Parameter:	Core production for the first year of operation
Limit:	2,167 tons of cores per month for the first year of operation

YEAR: _____

Month	Core production (tons)
Month 1	
Month 2	
Month 3	

9 No deviation occurred in this quarter.

9 Deviation/s occurred in this quarter.
Deviation has been reported on: _____

Submitted by: _____
Title / Position: _____
Signature: _____
Date: _____
Phone: _____

Attach a signed certification to this report.

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
COMPLIANCE DATA SECTION

Part 70 Source Modification Quarterly Report

Source Name:	Waupaca Foundry, Inc.
Source Address:	9856 State Highway 66, Tell City, Indiana 47586
Mailing Address:	P.O. Box 249, Waupaca Wisconsin 54981
Source Modification No.:	123-12948-00019
Facility:	Two (2) Isocure core machines identified as P44
Parameter:	Binder usage for the first year of operation
Limit:	32.5 tons of binder per month for the first year of operation

YEAR: _____

Month	Binder Usage (tons)
Month 1	
Month 2	
Month 3	

9 No deviation occurred in this quarter.

9 Deviation/s occurred in this quarter.
Deviation has been reported on: _____

Submitted by: _____
Title / Position: _____
Signature: _____
Date: _____
Phone: _____

Attach a signed certification to this report.

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
COMPLIANCE DATA SECTION

Part 70 Source Modification Quarterly Report

Source Name:	Waupaca Foundry, Inc.
Source Address:	9856 State Highway 66, Tell City, Indiana 47586
Mailing Address:	P.O. Box 249, Waupaca Wisconsin 54981
Source Modification No.:	123-12948-00019
Facility:	Two (2) Isocure core machines identified as P44
Parameter:	Core production
Limit:	26,000 tons of cores per 12 consecutive month period

YEAR: _____

Month	Column 1	Column 2	Column 1 + Column 2
	This Month	Previous 11 Months	12 Month Total
Month 1			
Month 2			
Month 3			

9 No deviation occurred in this quarter.

9 Deviation/s occurred in this quarter.
Deviation has been reported on: _____

Submitted by: _____
Title / Position: _____
Signature: _____
Date: _____
Phone: _____

Attach a signed certification to this report.

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
COMPLIANCE DATA SECTION

Part 70 Source Modification Quarterly Report

Source Name:	Waupaca Foundry, Inc.
Source Address:	9856 State Highway 66, Tell City, Indiana 47586
Mailing Address:	P.O. Box 249, Waupaca Wisconsin 54981
Source Modification No.:	123-12948-00019
Facility:	Two (2) Isocure core machines identified as P44
Parameter:	Binder usage
Limit:	390 tons of binder per 12 consecutive month period

YEAR: _____

Month	Column 1	Column 2	Column 1 + Column 2
	This Month	Previous 11 Months	12 Month Total
Month 1			
Month 2			
Month 3			

9 No deviation occurred in this quarter.

9 Deviation/s occurred in this quarter.
Deviation has been reported on: _____

Submitted by: _____
Title / Position: _____
Signature: _____
Date: _____
Phone: _____

Attach a signed certification to this report.

Indiana Department of Environmental Management
Office of Air Quality

Addendum to the
Technical Support Document for a Significant Source Modification
to a Part 70 Operating Permit

Source Name:	Waupaca Foundry, Inc.
Source Location:	9856 State Highway 66, Tell City, IN 47586
County:	Perry
SIC Code:	3321
Operation Permit No.:	T123-9234-00019
Operation Permit Issuance Date:	not yet issued
Significant Source Modification No.:	123-12948-00019
Permit Reviewer:	Nisha Sizemore

On April 26, 2001, the Office of Air Quality (OAQ) had a notice published in The Perry County News, Tell City, Indiana, stating that Waupaca Foundry, Inc. had applied for a significant source modification to a Part 70 Operating Permit to operate a two new core machines with a scrubber for VOC control. The notice also stated that OAQ proposed to issue a permit for this operation and provided information on how the public could review the proposed permit and other documentation. Finally, the notice informed interested parties that there was a period of thirty (30) days to provide comments on whether or not this permit should be issued as proposed.

Upon further review, IDEM has decided to make the following change to the permit:

Section B

Since no public comments were received on the draft permit, Condition B.2 has been changed to state that the permit is effective upon issuance.

B.2 Effective Date of the Permit [40CFR 124]

Pursuant to 40 CFR 124.15, 40 CFR 124.19, and 40 CFR 124.20, ~~the effective date of~~ this permit ~~will be thirty-three (33) days after~~ **is effective upon** issuance.

Indiana Department of Environmental Management
Office of Air Quality

Technical Support Document (TSD) for a Part 70 Significant Source Modification Requiring PSD Review.

Source Background and Description

Source Name:	Waupaca Foundry, Inc.
Source Location:	9856 State Highway 66, Tell City, IN 47586
County:	Perry
SIC Code:	3321
Operation Permit No.:	T123-9234-00019
Operation Permit Issuance Date:	not yet issued
Significant Source Modification No.:	123-12948-00019
Permit Reviewer:	Nisha Sizemore

The Office of Air Quality (OAQ) has reviewed a modification application from Waupaca Foundry, Inc. relating to the construction of the following emission units and pollution control devices:

One (1) new core making process, identified as P44, with a maximum capacity of 6 tons of cores per hour, including the following facilities:

(1) Two (2) core mixers, each with a maximum capacity of 3 tons of core sand per hour and 30.4 pounds of resin per ton of core, with emissions uncontrolled;

(2) Two (2) new Isocure phenolic urethane cold-box core machines, each with a maximum capacity of 3 tons of cores per hour and 3 pounds of triethylamine (TEA) catalyst per ton of core, with VOC emissions controlled by an acid scrubber (TEA scrubber), identified as C14, and exhausting through stack 14;

(3) One (1) existing core sand handling system, which is being modified to increase the capacity from 20 tons of core sand per hour to 26 tons of core sand per hour, with emissions controlled by an existing baghouse, which is also being upgraded. The baghouse flow rate will increase from 7,000 acfm to 14,000 acfm. The baghouse is identified as C08 and exhausts to stack S08.

Discussion of Issuing Separate Approvals

On May 25, 2000, Waupaca Foundry, Inc. submitted an application to the OAQ requesting to construct one new shotblast machine, two new core machines, and two new core sand mixers. The installation of the shotblast machine, the new core machines, and the new core sand mixers are necessary in order for the source to be able to produce smaller castings than they are currently capable of producing. Since all of these emission units are necessary in order to accommodate

the production of these new smaller castings, the OAQ has determined that the installation of these emission units should be considered as a single modification for the purposes of determining PSD applicability.

Even though the installation of these emission units is being considered as a single modification, due to time constraints the experienced by the source, the PSD permit for approval to construct and operate the new shotblast machine has already been issued. The PSD permit for the shotblast machine, identified as Significant Source Modification Number 123-12331-00019 was issued on January 31, 2001. The OAQ is now proposing to issue this PSD permit, identified as Significant Source Modification 123-12948-00019, for approval to construct and operate the core machines and core sand mixers, and for the increased utilization of the rest of the emission units at the foundry. These two permits are being issued separately in order to accommodate Waupaca Foundry's expeditious schedule for construction of the shotblast machine. However, issuing two separate PSD permits will in no way allow Waupaca Foundry to circumvent the requirements of the PSD rules. Even though the emissions from the shotblast machine alone are less than the PSD applicability thresholds, the shotblast machine was still subject to the requirements of PSD because the total emissions from the project are greater than the PSD applicability thresholds. The emissions from the rest of the project include emissions from the core machines and core sand mixers as well as emissions from the increased utilization of other existing emission units at the foundry which will occur as a result of this project. The increased utilization of other existing foundry emission units is due to the fact that the foundry plans to increase overall plant production due to its newly acquired capability to produce the smaller castings.

The part of the project being permitted currently includes the following:

(1) two new sand/resin mixers, each with a maximum capacity of 3 tons per hour;

(2) phenolic-urethane cold-box core machines, identified as P44, each with a maximum capacity of 3 tons of cores per hour;

(3) modifications to the existing core sand handling system; and

(4) increased utilization of other existing processes at the plant due to the potential increase in production capacity as a direct result of this project. Emissions were calculated for increased utilization of the following existing facilities. No physical modifications are proposed for these facilities; therefore, pursuant to 40 CFR 52.21(i)(6) they do not have to comply with BACT.

(A) P33 - Phase 2 cupola;
(B) P35 - Ductile iron treatment stations;
(C) P60 - Line 5 pouring, mold cooling;
(D) P62 - Line 5 castings cooling;
(E) P61 - Line 5 shakeout;
(F) P63 - Line 5 pick and sort;
(G) P64 - Line 5 cleaning and grinding;
(H) P65 - Line 6 pouring, mold cooling;
(I) P62 - Line 6 castings cooling;
(J) P66 - Line 6 shakeout;
(K) P68 - Line 6 pick and sort;
(L) P69 - Line 6 cleaning and grinding;
(M) P70 - Line 7 pouring, mold cooling;
(N) P72 - Line 7 castings cooling;
(O) P71 - Line 7 shakeout;
(P) P73 - Line 7 pick and sort;

(Q) P74 - Line 7 cleaning and grinding;
(R) P75 - Line 8 pouring, mold cooling;
(S) P77 - Line 8 castings cooling;
(T) P76 - Line 8 shakeout;
(U) P78 - Line 8 pick and sort;
(V) P79 - Line 8 cleaning and grinding;
(W) P80 - Return sand handling and screening;
(X) P81 - Sand mulling and handling;
(Y) P82 - Sand blending and cooling;
(Z) P83 - Spent sand and dust handling; and
(AA) P84 - Metal returns handling.

Explanation of Increased Utilization Issue

Waupaca Foundry states that the original Phase 2 operations were constructed with the intent to produce large castings requiring larger cores or no cores at all. Waupaca's Phase 2 operations began operation in late 1999. Recently, the market for ductile iron castings has shifted such that there is now less demand for the large castings with large cores. The market now demands smaller castings with smaller cores. The Phase 2 operations at Waupaca are not currently capable of producing the smaller cores. Also, the existing shotblast machines at the Phase 2 operations at Waupaca are better for use with larger castings. Waupaca has stated that the smaller castings tend to break when used in these larger shotblast machines. As a result, Waupaca's Phase 2 operations cannot currently operate at its maximum capacity, because there is not sufficient demand for the castings that the Phase 2 operations are capable of producing. In order to take advantage of the change in the market demand for smaller ductile iron castings, Waupaca needs to install core machines capable of producing smaller cores and they need to install a shotblast machine capable of finishing the smaller castings. Once Waupaca is capable of producing these smaller castings, they will be able to more fully utilize their existing Phase 2 operations. Therefore, as part of this review, IDEM has evaluated the emissions from the increased utilization of the existing Phase 2 operations.

Sources of Emissions

The core machines will have two sources of VOC emissions; (1) the TEA catalyst usage, and (2) other VOCs emitted from the partial evaporation of the binder material used in making the cores. Based on current estimates, approximately 89% (i.e. 3 pounds per ton of cores) of the uncontrolled VOC emissions are generated by the TEA catalyst usage, and 11% (i.e. 0.36 pounds per ton of cores) are generated by the binder material; however, while emissions of TEA can be conservatively assumed to be equivalent to the TEA usage rate, there is little information available to estimate the emissions of VOCs from the binder material. Therefore, IDEM has used information obtained from Ashland Chemical, the binder supplier, in order to estimate evaporative losses from the binder system to be used with the new mixers and core machines. The VOC emissions from the core preparation facilities require BACT review under 326 IAC 2-2-3.

The existing core sand handling system, identified as P42, currently has a maximum production capacity of 20 tons of cores per hour. This existing sand system will be modified to accommodate the additional sand handling capacity associated with supplying sand to the new core machines. The new maximum capacity of the core sand handling system will be 26 tons of sand per hour.

Part 70 Applicability

Waupaca Foundry, Inc. submitted a Part 70 permit on November 20, 1997. The Part 70 permit application is currently under review by IDEM.

Enforcement Issue

The source has the following enforcement actions pending:

(1) A notice of violation (NOV) has been issued to the source for failure to install and operate a baghouse to control emissions from the cupola scrap and charge handling process.

(2) A notice of violation (NOV) has been issued to the source for opacity violations.

(3) A referral has been sent to the Office of Enforcement because the source failed some stack tests.

(4) A referral has been sent to the Office of Enforcement because the source made modifications to the existing ductile iron treatment stations prior to obtaining a PSD permit.

Stack Summary

Stack ID	Operation	Height (feet)	Diameter (feet)	Flow Rate (acfm)	Temperature (^{0}F)
existing stack S14	existing TEA scrubber C14 controlling new core machines P44	65	3.0	26,000 existing, 8,000 additional, 34,000 total	80
existing stack S08	existing baghouse C08 controlling modified core sand handling process P42	120	4.0	7,000 existing, 5,000 additional, 12,000 total	80

Recommendation

The staff recommends to the Commissioner that the Part 70 PSD Significant Source Modification be approved. This recommendation is based on the following facts and conditions:

Unless otherwise stated, information used in this review was derived from the application and additional information submitted by the applicant.

An application for the purposes of this review was received on May 31, 2000. Additional information was received on August 2, 2000, August 31, 2000, October 31, 2000, February 19, 2001, March 21, 2001, March 27, 20001, April 4, 2001, April 5, 2001, April 10, 2001, and April 12, 2001.

Emission Calculations

Calculations are provided in Appendix A of this document. (20 pages)

Potential To Emit of Modification

Pursuant to 326 IAC 2-1.1-1(16), Potential to Emit is defined as "the maximum capacity of a stationary source to emit any air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of a source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or type or amount of material combusted, stored, or processed shall be treated as part of its design if the limitation is enforceable by the U. S. EPA."

This table reflects the PTE before controls for the entire project. Control equipment is not considered federally enforceable until it has been required in a federally enforceable permit.

Pollutant	Uncontrolled Potential To Emit for entire project (tons/year)
PM	1340
PM-10	1340
SO_2	0.00
VOC	347
CO	0.00
NO_x	0.00

HAP's	Uncontrolled Potential To Emit for entire project (tons/year)
Triethylamine (TEA)	78.84
formaldehyde	0.026
naphthalene	less than 10
trimethylbenzene	less than 10
lead	0.3967
arsenic	0.0106
beryllium	0.0015
cadmium	0.0023
nickel	0.2144
antimony	0.1139
cobalt	0.0402
chromium	0.5964
copper	1.2465
manganese	6.1827
selenium	0.0134
TOTAL	greater than 25

Justification for Modification

The Part 70 Operating permit is being modified through a Part 70 Significant Source Modification. This modification is being performed pursuant to 326 IAC 2-7-10.5(f)(1), which states that any modification subject to the requirements of 326 IAC 2-2 (Prevention of Significant Deterioration (PSD)) requires a significant source modification.

County Attainment Status

The source is located in Perry County.

Pollutant	Status
PM-10	attainment
SO_2	attainment
NO_2	attainment
Ozone	attainment
CO	attainment
Lead	attainment

(a) Volatile organic compounds (VOC) and oxides of nitrogen (NOx) are precursors for the formation of ozone. Therefore, VOC and NO_X emissions are considered when evaluating the rule applicability relating to the ozone standards. Perry County has been designated as attainment or unclassifiable for ozone. Therefore, VOC and NOx emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2 and 40 CFR 52.21.

(b) Perry County has been classified as attainment or unclassifiable for all other criteria pollutants. Therefore, these emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2 and 40 CFR 52.21.

Source Status

Existing Source PSD or Emission Offset Definition (emissions after controls, based upon 8760 hours of operation per year at rated capacity and/or as otherwise limited):

Pollutant	Emissions (tons/year)
PM	488
PM-10	488
SO_2	208
VOC	587
CO	4869
NOx	293

This existing source is a major stationary source because an attainment regulated pollutant is emitted at a rate of 100 tons per year or more, and this source is one of the 28 listed source categories, specifically a secondary metal production facility.

These emissions are based upon the technical support document for CP 123-8451-00019.

Potential to Emit of Modification After Issuance

The table below summarizes the potential to emit, reflecting all limits, of the significant emission units after controls. The control equipment is considered federally enforceable only after issuance of this Part 70 source modification.

	Potential to Emit (tons/year)						
Process/facility	PM	PM-10	SO_2	VOC	CO	NO_X	Total HAPs
core mixers	0.00	0.00	0.00	0.71	0.00	0.00	0.71
core machines	0.00	0.00	0.00	4.75	0.00	0.00	4.75
core sand handling system	1.57	1.57	0.00	0.00	0.00	0.00	0.00
shotblast machine (already permitted but part of same modification)	3.75	3.75	0.00	0.00	0.00	0.00	0.001
increased utilization of other existing plant processes	129	129	73.2	149	181	143	55.8
Total for this modification	134.32	124.32	75.2	154.46	181	143	61.261
PSD Significance Level	25	15	40	40	100	40	0.6

This modification to an existing major stationary source is major for all criteria pollutants; however, the only emission units subject to BACT are the shotblast machine (already permitted under PSD permit 123-12331), the core mixers, the core machines, and the core sand handling system. These facilities only emit PM, PM10, VOC, and HAPs; therefore, these are the only pollutants evaluated pursuant to BACT. There will be an increased utilization of other existing emission units at the foundry as a result of this project. The increased utilization of other existing foundry emission units is due to the fact that the foundry plans to increase overall plant production due to its newly acquired capability to produce the smaller castings. This permit also serves to increase the limit on baghouse C08 controlling the core sand handling system. Since these limits were previously established in a PSD permit, increasing those limits requires a PSD modification. Therefore, pursuant to 326 IAC 2-2, and 40 CFR 52.21, the PSD requirements apply.

Federal Rule Applicability

(a) There are no New Source Performance Standards (NSPS)(326 IAC 12 and 40 CFR Part 60) applicable to this proposed modification.

(b) There are no National Emission Standards for Hazardous Air Pollutants (NESHAPs)(326 IAC 14 and 40 CFR Part 61 or 63) applicable to this proposed modification.

State Rule Applicability - Individual Facilities

326 IAC 2-1-3.4 (New Source Toxics Control)

This proposed project is potentially subject to the New Source Toxics Control rule which requires a constructed or reconstructed major source of HAPs to control emissions consistent with MACT. Because there is no established NESHAP for grey/ductile iron foundries, this source, if subject to this

rule, would be required to make the MACT determination on a case-by-case basis. The requirements of this rule are consistent with the final federal rule implementing Section 112(g)(2)(B) of the Clean Air Act.

The modifications include increasing the capacity of the existing core sand handling system and installing one new shotblast machine. These modifications are not significant enough to be considered a reconstruction project, which is defined in 40 CFR 63.41 as a change to the existing process or production unit that in and of itself emits or has the potential to emit 10 tons per year of any HAP or 25 tons per year of any combination of HAP. Therefore, the New Source Toxics Control rule does not apply to these modifications.

The potential to emit of the new core making process P44, including two mixers and two core machines, has been limited in this permit, by federally enforceable permit limitations, to less than10 tons per year of a single HAP and 25 tons per year of a combination of HAPs. Therefore, the New Source Toxics Control rule does not apply to the new core making process identified as P44.

326 IAC 2-2 (Prevention of Significant Deterioration (PSD) Rules)

This proposed modification is subject to the Prevention of Deterioration (PSD) rules for PM, PM_{10}, VOC, NOx, CO, SO_2, lead, and beryllium because the emissions from these pollutants are above the PSD significant threshold levels reported in 326 IAC 2-2-1. The PSD provisions require that this major modification be reviewed to ensure compliance with the National Ambient Air Quality Standards, the applicable PSD air quality increments, and the requirements to apply the best available control technology on the project's emissions. However, the only facilities that are new or physically modified facilities are the shotblast machine, two mixers, two core machines, and the core sand handling system; therefore BACT will only apply to these facilities. These facilities only emit PM, PM10, VOC, lead, and beryllium; therefore BACT will only apply for these pollutants. The PSD permit for the shotblast machine has already been issued. The shotblast machine is the only new or physically modified facility that emits lead or beryllium; therefore, BACT for lead and beryllium will not be addressed in this approval.

The *Air Quality Analysis* report included in Appendix C was conducted to show that this major modification does not violate the National Ambient Air Quality Standards (NAAQS) and does not exceed the incremental consumption above 80 percent of the PSD increment for any pollutant. The best available control technologies (BACT) for the two core machines, two mixers, and core sand handling system covered in this major modification is determined on a case-by-case basis by reviewing similar process controls and new available technologies. In addition, the cost per ton of pollutant removed, energy requirements, and environmental impacts are weighed in IDEM's final decision. Control technology summaries of the facilities covered in this major modification are discussed in the *BACT Analysis Report* included in Appendix B.

326 IAC 6-3-2 (Process Operations)

Pursuant to this rule the particulate matter (PM) from the core sand handling system identified as P42 shall not exceed 36.4 pounds per hour when operating at a process weight rate of 26.0 tons of sand per hour. The limit is determined by use of the following equation:

Interpolation of the data for the process weight rate up to sixty thousand (60,000) pounds per hour shall be accomplished by use of the equation:

$E = 4.10\ P^{0.67}$ where E = rate of emission in pounds per hour and
P = process weight rate in tons per hour

The baghouse identified as C08 shall be in operation at all times the core sand handling system identified as P42 is in operation, in order to comply with this limit.

326 IAC 8-1-6 (VOC Rules)

The new core making process identified as P44, including two mixers and two core machines, has potential VOC emissions of greater than 25 tons per year. Pursuant to this rule, the process shall reduce emissions using BACT. The VOC emissions from this process are also limited by the BACT requirements of 326 IAC 2-2. Control technology summaries of the facilities generating VOC emissions from this major modification are discussed in the *BACT Analysis Report* included in Appendix B.

Compliance Requirements

Permits issued under 326 IAC 2-7 are required to ensure that sources can demonstrate compliance with applicable state and federal rules on a more or less continuous basis. All state and federal rules contain compliance provisions, however, these provisions do not always fulfill the requirement for a more or less continuous demonstration. When this occurs IDEM, OAQ, in conjunction with the source, must develop specific conditions to satisfy 326 IAC 2-7-5. As a result, compliance requirements are divided into two sections: Compliance Determination Requirements and Compliance Monitoring Requirements.

Compliance Determination Requirements in Section D of the permit are those conditions that are found more or less directly within state and federal rules and the violation of which serves as grounds for enforcement action. If these conditions are not sufficient to demonstrate continuous compliance, they will be supplemented with Compliance Monitoring Requirements, also Section D of the permit. Unlike Compliance Determination Requirements, failure to meet Compliance Monitoring conditions would serve as a trigger for corrective actions and not grounds for enforcement action. However, a violation in relation to a compliance monitoring condition will arise through a source's failure to take the appropriate corrective actions within a specific time period.

The compliance monitoring requirements applicable to this modification are as follows:

(1) The baghouse C15 controlling shotblast machine P55 has applicable compliance monitoring conditions as specified below:

(a) Visible emissions notations of the core sand handling stack exhaust shall be performed once per shift during normal daylight operations. A trained employee will record whether emissions are normal or abnormal. For processes operated continuously "normal" means those conditions prevailing, or expected to prevail, eighty percent (80%) of the time the process is in operation, not counting startup or shut down time. In the case of batch or discontinuous operations, readings shall be taken during that part of the operation that would normally be expected to cause the greatest emissions. A trained employee is an employee who has worked at the plant at least one (1) month and has been trained in the appearance and characteristics of normal visible emissions for that specific process. The Preventive Maintenance Plan for this unit shall contain troubleshooting contingency and corrective actions for when an abnormal emission is observed. Failure to take response steps in accordance with Section C - Compliance Monitoring Plan - Failure to Take Response Steps, shall be considered a violation of this permit.

(b) The Permittee shall record the total static pressure drop across the baghouse controlling the core sand handling system, at least once per shift when the core sand handling system is in operation. Unless operated under conditions for which the Preventive Maintenance Plan specifies otherwise, the pressure drop across the baghouse shall be maintained within the range of 1 to 4 inches of water or a range established during the latest stack test. The Preventive Maintenance Plan for this

unit shall contain troubleshooting contingency and corrective actions for when the pressure reading is outside of the above mentioned range for any one reading. Failure to take response steps in accordance with Section C - Compliance Monitoring Plan - Failure to Take Response Steps, shall be considered a violation of this permit.

(c) An inspection shall be performed each calender quarter of all bags controlling the core sand handling process. All defective bags shall be replaced.

(d) In the event that bag failure has been observed.

(I) The affected compartments will be shut down immediately until the failed units have been repaired or replaced. Within eight (8) hours of the determination of failure, response steps according to the timetable described in the Compliance Response Plan shall be initiated. For any failure with corresponding response steps and timetable not described in the Compliance Response Plan, response steps shall be devised within eight (8) hours of discovery of the failure and shall include a timetable for completion. Operations may continue only if the event qualifies as an emergency and the Permittee satisfies the requirements of the emergency provisions of this permit (Section B - Emergency Provisions).

(II) For single compartment baghouses, failed units and the associated process will be shut down immediately until the failed units have been repaired or replaced. Operations may continue only if the event qualifies as an emergency and the Permittee satisfies the requirements of the emergency provisions of this permit (Section B - Emergency Provisions).

(2) The scrubber controlling the core machines P44 has applicable compliance monitoring conditions as specified below:

(a) The Permittee shall monitor and record the pressure drop of the scrubber, at least once per shift. Unless operated under conditions for which the Compliance Response Plan specifies otherwise, the pressure drop across the scrubber shall be maintained within 2 to 5 inches of water, or a range established during the latest stack test. The Permittee shall monitor and record the pH of the TEA scrubber solution controlling the phenolic urethane core machines at least once per shift. Unless operated under conditions for which the Compliance Response Plan specifies otherwise, the pH of the scrubber solution shall be maintained at or below 4.5 or a maximum level established during the latest stack test. The Permittee shall continuously monitor the flow rate of the scrubbing liquid. Unless operated under conditions for which the Compliance Response Plan specifies otherwise, the flow rates shall be maintained at the minimum of 235 gallons per minute or a minimum flow rate established during the latest stack test. The Compliance Response Plan for the scrubber shall contain troubleshooting contingency and response steps for when the pressure drop reading is outside of the normal range for any one reading, or the flow rate is below the minimum for any one reading, or the pH is above the maximum for any one reading.

(b) The instruments used for determining the pressure drops, pH level, and flow rates shall be subject to approval by IDEM, OAQ, and shall be calibrated at least once every six (6) months.

(c) The gauge employed to take the pressure drops across the scrubber or any part of

the facility shall have a scale such that the expected normal reading shall be no less than 20 percent of full scale and be accurate within ± 2% of full scale reading. The instrument shall be quality assured and maintained as specified by the vendor.

(d) An inspection shall be performed each calendar quarter of the scrubber. Defective scrubber part(s) shall be replaced. A record shall be kept of the results of the inspection and the number of scrubber part(s) replaced.

(e) In the event that a scrubber's failure has been observed:

(I) The affected process will be shut down immediately until the failed unit has been replaced.

(II) Based upon the findings of the inspection, any additional corrective actions will be devised within eight (8) hours of discovery and will include a timetable for completion.

(f) The Permittee shall perform emissions testing as specified in the table below utilizing methods as approved by the Commissioner. The stack tests shall be repeated at least once every 5 years from the date of the valid compliance demonstration. In addition to these requirements, IDEM may require compliance testing when necessary to determine if the facilities are in compliance. For all PM10 tests, PM10 includes filterable and condensible PM10.

Facilities to be tested	Pollutants for which to test
baghouse C08 controlling core sand handling system	PM and PM10
P44 core mixers	VOC
P44 core machines	TEA and total VOC

These monitoring conditions are necessary in order to ensure compliance with 326 IAC 2-2 (PSD), 326 IAC 8-1-6 (BACT), and 326 IAC 6-3-2 (Process Operations).

Conclusion

The construction of this proposed modification shall be subject to the conditions of the attached proposed Part 70 PSD Significant Source Modification No. 123-12948-00019.

Waupaca Foundry, Inc.
Tell City, Indiana
PSD Permit 123-12948-00019

Core Machines

Number of core machines proposed: 2
Maximum capacity: 3 tons cores/hr each
Proposed Production Limit: 26,000 tons of cores per 12 consecutive month period

TEA Emissions at core machines

TEA Usage Rate: 3 lbs/ton cores (based on usage estimates by Waupaca)
Uncontrolled TEA Emissions: 3 lb TEA/ton cores x 26,000 tons cores/yr / (2000 lbs/ton) = 39.00 tons/yr
Controlled TEA Emissions: 39.00 tons/yr x (1-98% control eff) = 0.78 tons TEA / yr

VOC emissions from resin usage

Emission factors obtained from Ashland Chemical, based on their laboratory testing for the new binder system.

Binder system	Total VOC emissions (lbs/lb resin)	Resin Usage During Ashland Tests (weight %)
New binder system 319W	0.012	1.0%
Waupaca's existing binder system 397C	0.030	1.0%

In order to determine the equivalent emission in pounds per ton of cores produced, we use Waupaca's maximum binder usage, which is 1.5% by weight.
Total emission factor for core machines and mixers = 0.012 lb/lb resin x 1.5% resin x 2000 lbs/ton = 0.360 lbs VOC/ton cores

In order to determine the percentage emitted at the mixers, versus the percentage emitted at the core machines, we use Waupaca Foundry site specific stack test results for mixing, and correct for the maximum percent binder usage.
The stack test was conducted in December 2001. The resin usage during the test was 1.29%.
The test results were as follows:

Process	Emissions (lbs/ton)	Actual Resin Usage (weight %)	Maximum Resin Usage (weight %)
mixing	0.117	1.29%	1.50%

Mixer emission factor = 0.117 lbs/ton x (1.50%/1.29%) x (0.012 lb/lb resin / 0.030 lb/lb resin) = 0.054 lbs VOC per ton core

Waupaca has agreed to a production limit of 26,000 tons of cores per 12 consecutive month period
VOC emissions at mixer = 0.054 lb VOC/ton cores x 26,000 tons cores/yr / (2000 lbs/ton) = 0.71 tons/yr

Total emission factor for core machines and mixers 0.360 lb/ton cores
Emission factor for mixers 0.054 lb/ton cores
Therefore core machine emission factor = 0.306 lb/ton cores

VOC emissions from binder at core machines = 0.306 lb VOC/ton cores x 26,000 tons cores/yr / (2000 lbs/ton) = 3.97 tons/yr
TEA emissions at core machines = 3 lb TEA/ton cores x 26000 tons cores/yr / (2000 lbs/ton) = 39.00 tons/yr
Total VOC at core machines = 3.306 lb VOC/ton cores x 26,000 tons cores/yr / (2000 lbs/ton) = 42.97 tons/yr

Source Name: **Waupaca Foundry**
Source Address: **9856 State Highway 66, Tell City, IN**
Permit Number: **123-12948-00019**
Permit Reviewer: **Nisha Sizemore**

RTO Analysis for Core Machines

RTO Control Effectiveness:	98%	for all VOCs	
98% of all VOCs is	42.11		
TEA Emissions after RTO:	0.78	tons/yr	
non-TEA Emissions after RTO:	0.08	tons/yr	
Total VOC Emissions after RTO:	0.86	tons/yr	
Annualized cost of RTO:	380,738	dollars	
Overall cost effectiveness:	9041	$/ton of VOC removed	

TEA Scrubber Analysis

TEA Scrubber Control Effectiveness:	98%	for TEA	0% for all other VOCs
98% of all TEA is	38.22	tons/yr	
Overall control efficiency is:	88.9%	for all VOCs	
TEA Emissions after TEA scrubber:	0.78	tons/yr	
non-TEA Emissions after TEA scrubber:	3.97	tons/yr	
Total VOC Emissions after TEA scrubber:	4.75	tons/yr	
Annualized cost of TEA scrubber:	108,354	dollars	
Overall cost effectiveness:	2835	$/ton of VOC removed	

APPENDIX B
BACT ANALYSIS REPORT

Source Background and Description

Source Name:	Waupaca Foundry, Inc.
Source Location:	9856 State Highway 66, Tell City, IN 47586
County:	Perry
SIC Code:	3321
Operation Permit No.:	T123-9234-00019
Operation Permit Issuance Date:	not yet issued
Significant Source Modification No.:	123-12948-00019
Permit Reviewer:	Nisha Sizemore

Detailed Project Description

On May 31, 2000, Waupaca Foundry, Inc. submitted an application to the OAQ requesting to construct one new shotblast machine, two new core machines, and two new core sand mixers. The installation of the shotblast machine, the new core machines, and the new core sand mixers are necessary in order for the source to be able to produce smaller castings than they are currently capable of producing. Since all of these emission units are necessary in order to accommodate the production of these new smaller castings, the OAQ has determined that the installation of these emission units should be considered as a single modification for the purposes of determining PSD applicability.

Even though the installation of these emission units is being considered as a single modification, due to time constraints experienced by the source, the PSD permit for approval to construct and operate the new shotblast machine has already been issued. The PSD permit for the shotblast machine, identified as PSD Significant Source Modification Number 123-12331-00019 was issued on January 31, 2001. The OAQ is now proposing to issue this PSD permit, identified as Significant Source Modification 123-12948-00019, for approval to construct and operate the core machines and core sand mixers, and for the increased utilization of the rest of the emission units at the foundry. These two permits are being issued separately in order to accommodate Waupaca Foundry's expeditious schedule for construction of the shotblast machine. However, issuing two separate PSD permits will in no way allow Waupaca Foundry to circumvent the requirements of the PSD rules. Even though the emissions from the shotblast machine alone are less than the PSD applicability thresholds, the shotblast machine was still subject to the requirements of PSD because the total emissions from the entire project are greater than the PSD applicability thresholds. The emissions from the rest of the project include emissions from the core machines and core sand mixers as well as emissions from the increased utilization of other existing emission units at the foundry which will occur as a result of this project. The increased utilization of other existing foundry emission units is due to the fact that the foundry plans to increase overall plant production due to its newly acquired capability to produce the smaller castings.

Waupaca Foundry states that the original Phase 2 operations were constructed with the intent to produce large castings requiring larger cores or no cores at all. Waupaca's Phase 2 operations began operation in late 1999. Recently, the market for ductile iron castings has shifted such that there is now less demand for the large castings with large cores. The market now demands smaller castings with smaller cores. The Phase 2 operations at Waupaca are not currently capable of producing the smaller cores. Also, the existing shotblast machines at the Phase 2 operations at Waupaca are better for use with larger castings. Waupaca has stated that the smaller castings tend to break when used in these larger shotblast machines. As a result, Waupaca's Phase 2 operations cannot currently operate at its maximum capacity, because there is not sufficient demand for the castings that the Phase 2 operations are capable of producing. In order to take advantage of the change in the market demand for smaller ductile iron castings, Waupaca needs to install core machines capable of producing smaller cores and they need to install a shotblast machine capable of finishing the smaller castings. Once Waupaca is capable of producing these smaller castings, they will be able to more fully utilize their

existing Phase 2 operations. Therefore, as part of this review, IDEM has evaluated the emissions from the increased utilization of the existing Phase 2 operations.

The part of the project being permitted currently includes the following:

(1) two new sand/resin mixers, each with a maximum capacity of 3 tons per hour;

(2) two phenolic-urethane cold-box core machines, identified as P44, each with a maximum capacity of 3 tons of cores per hour;

(3) modifications to the existing core sand handling system to increase the maximum capacity from 20 tons of sand per hour to 26 tons of sand per hour; and

(4) increased utilization of other existing processes at the plant due to the potential increase in production capacity as a direct result of this project. Emissions were calculated for increased utilization of the following existing facilities. No physical modifications are proposed for these facilities; therefore, pursuant to 40 CFR 52.21(i)(6) they do not have to comply with BACT.

(A) P33 - Phase 2 cupola;
(B) P35 - Ductile iron treatment stations;
(C) P60 - Line 5 pouring, mold cooling;
(D) P62 - Line 5 castings cooling;
(E) P61 - Line 5 shakeout;
(F) P63 - Line 5 pick and sort;
(G) P64 - Line 5 cleaning and grinding;
(H) P65 - Line 6 pouring, mold cooling;
(I) P62 - Line 6 castings cooling;
(J) P66 - Line 6 shakeout;
(K) P68 - Line 6 pick and sort;
(L) P69 - Line 6 cleaning and grinding;
(M) P70 - Line 7 pouring, mold cooling;
(N) P72 - Line 7 castings cooling;
(O) P71 - Line 7 shakeout;
(P) P73 - Line 7 pick and sort;
(Q) P74 - Line 7 cleaning and grinding;
(R) P75 - Line 8 pouring, mold cooling;
(S) P77 - Line 8 castings cooling;
(T) P76 - Line 8 shakeout;
(U) P78 - Line 8 pick and sort;
(V) P79 - Line 8 cleaning and grinding;
(W) P80 - Return sand handling and screening;
(X) P81 - Sand mulling and handling;
(Y) P82 - Sand blending and cooling;
(Z) P83 - Spent sand and dust handling; and
(AA) P84 - Metal returns handling.

The core machines will have two sources of VOC emissions; (1) the TEA catalyst usage; and (2) other VOCs emitted from the partial evaporation of the binder material used in making the cores. Based on current estimates, approximately 89% (i.e. 3 pounds per ton of cores) of the uncontrolled VOC emissions are generated by the TEA catalyst usage, and 11% (i.e. 0.36 pounds per ton of cores) are generated by the binder material;

however, while emissions of TEA can be conservatively assumed to be equivalent to the TEA usage rate, there is little information available to estimate the emissions of VOCs from the binder material. IDEM has used information from Ashland Chemical Company in order to estimate VOC emissions for the new core machines and the new mixers. Ashland has conducted laboratory testing to determine VOC evaporative losses from core mixing and core making when using a new lower-emitting binder system they have developed. Waupaca is proposing to utilize this new lower emitting binder system in their proposed new core making process. The VOC emissions from the proposed new core making facilities require BACT review under 326 IAC 2-2-3.

The existing core sand handling system, identified as P42, currently has a maximum production capacity of 20 tons of cores per hour. This existing sand system will be modified to accommodate the additional sand handling capacity associated with supplying sand to the new core machines. The new maximum capacity of the core sand handling system will be 26 tons of sand per hour.

BACT Requirements for this Project

The source is located in Perry County which is designated as attainment or unclassifiable for all criteria pollutants. Based upon the emission calculations, the modification exceeds the PSD significant threshold levels stated in 326 IAC 2-2-1 for PM, PM_{10}, and VOC. Therefore, these pollutants were reviewed pursuant to the PSD Program (326 IAC 2-2 and 40 CFR 52.21). The PSD Program requires a BACT review and air quality modeling. BACT is an emission limitation based on the maximum degree of reduction of each pollutant subject to the PSD requirements. IDEM conducts BACT analyses in accordance with the *"Top-Down" Best Available Control Technology Guidance Document* outlined in the 1990 draft USEPA *New Source Review Workshop Manual*, (NSR Manual) which outlines the steps for conducting a top-down BACT analysis. Those steps are listed below.

(1) Identify all potentially available control options;
(2) Eliminate technically infeasible control options;
(3) Rank remaining control technologies by control effectiveness;
(4) Evaluate the most effective controls and document the results; and
(5) Select BACT.

Also in accordance with the *"Top-Down" Best Available Control Technology Guidance Document* outlined in the 1990 draft USEPA *New Source Review Workshop Manual*, BACT analyses take into account the energy, environmental, and economic impacts on the source. These reductions may be determined through the application of available control techniques, process design, and/or operational limitations. Such reductions are necessary to demonstrate that the emissions remaining after application of BACT will not cause or contribute to air pollution thereby protecting public health and the environment.

The following BACT determinations are based on the following information:

(1) The PSD permit application submitted by Waupaca Foundry on May 31, 2000;
(2) Additional documentation provided by Waupaca Foundry subsequent to the submittal of the application;
(3) Information from Ashland Chemical regarding the proposed binder system to be used in the core making process;
(4) Information from other vendors/suppliers;
(5) Information IDEM gained from other regulatory agencies;
(6) Other IDEM permits and permits from other regulatory agencies;
(7) The OAQPS control cost manual and trade journals; and
(8) The EPA RACT/BACT/LAER (RBLC) Clearinghouse.

BACT Analysis for VOCs and Organic HAPs from core machines

The phenolic-urethane core making operations will generate VOC/HAP emissions by the partial evaporation of the resins during mixing with the sand and during the catalysis step using triethylamine (TEA). Waupaca Foundry proposes to use a new binder system developed by Ashland Chemical as part of their proposed BACT analysis. Waupaca Foundry also proposes to utilize an existing TEA scrubber as BACT for the core machines. The existing TEA scrubber is currently in use at Waupaca to control other similar core machines. Waupaca proposes to upgrade the TEA scrubber to handle the additional airflow from the new core machines. Finally, as part of the BACT, Waupaca Foundry proposes a production limit of 26,000 tons of cores per year for both core machines combined. IDEM agrees with Waupaca's proposed BACT. The following discussion outlines the BACT analysis as proposed by Waupaca and IDEM's review of the source's BACT.

Step 1 - Identify Control Options (Including inherently lower-emitting processes)

The NSR Manual states that potentially applicable control alternatives can include inherently lower-emitting processes, including the use of materials and production processes and work practices that prevent emissions and result in lower "production-specific" emissions.[1] Accordingly, IDEM has reviewed Waupaca Foundry's choice of binder systems for use in their proposed new core making process. Two binder systems were evaluated, as follows.

Binder 397C/697C, which is the binder system that Waupaca currently uses in their other existing core machines; and
Binder 319W/619W, which is the new lower-emitting binder system that Ashland Chemical has developed.

The new 319W/619W binder system has not yet been fully utilized in any foundry; however Ashland has conducted laboratory testing to determine emissions. A summary of Ashland's laboratory test results are shown below.

Table 1
(Comparison of Binder System Evaporative Losses)

Binder System Identification	Total VOC emitted after 3 hours[2] (grams VOC/gram binder)
397C/697C	0.030
319W/619W	0.012

Waupaca proposes to use the new lower-emitting binder system from Ashland as part of their core making process. Information from Ashland indicates that using the proposed new binder system, Waupaca's VOC emissions from the evaporation of the binder materials at the mixers and core machines would be approximately

[1] New Source Review Workshop Manual, EPA, Office of Air Quality Planning and Standards, Research Triangle Park, Page B.10

[2] IDEM used the emissions measured after 3 hours because Ashland stated that the life of the core sand after being mixed with the binder material, would not exceed 3 hours. Therefore, it is clear that the time period from starting the mixing process to ending the core making process (at the core machines) could not exceed 3 hours.

0.012 pounds per pound of binder.

IDEM agrees that the use of this binder system shall be considered part of the BACT for the proposed new mixing and core making process. IDEM has not identified any other foundry using a lower-emitting binder system. Additionally Ashland Chemical has stated that this binder system is the lowest-emitting binder system currently available for use in this type of core making process.[3] Since the use of a lower-emitting binder system is a pollution prevention technique, it is considered the top BACT option. Since the binder system is inherent in the core making process, all further evaluation of additional control options will be considered in addition to the use of this binder system. In other words, when considering the cost effectiveness of add-on control systems, IDEM will consider the emission reductions in comparison with uncontrolled emissions utilizing this new lower-emitting binder system.

Control Options Identified - Four (4) available technologies were evaluated to further reduce VOC emissions from the core machines:

Refrigeration
Carbon adsorption
Regenerative incineration (hereafter referred to as regenerative thermal oxidizer (RTO))
Packed bed scrubber system (hereafter referred to as triethylamine (TEA) scrubber)

Step 2 - Eliminate technically infeasible control options

Refrigeration - The OAQPS manual states that refrigeration is considered a control alternative when the VOC concentration of the gas stream exceeds 50% of the LEL and the condensed VOC is a reusable product. Waupaca estimates that the outlet VOC concentration of the gas stream will be approximately 150 ppm or 1% of the LEL. Additionally, since the recovered VOC would be a combination of TEA and other VOCs, the TEA could not be reused. For these reasons, refrigeration is not considered a technically feasible control alternative.

Carbon Adsorption - IDEM has not identified any other foundries utilizing carbon adsorption for the control of VOC emissions from core machines; therefore, this control technology is considered unproven for this particular application. Discussions with a representative of Calgon Carbon indicate that the VOCs emitted at the core machines would be captured by the carbon adsorption system.[4] Therefore, even though this technology has not been proven for this particular application, it is considered to be possibly technically feasible, based on discussions with Calgon and Advanced Recovery Technologies Corporation.

TEA scrubber - TEA scrubbers are used in many other foundries to control the TEA emissions from this type of core machine. TEA scrubbers are a very reliable and proven control method for controlling TEA emissions from this type of operation. One advantage to using the TEA scrubber is that the TEA, which is used as a catalyst in the core making process, could be recycled. The scrubber uses a sulfuric acid solution to capture the spent TEA, which is then sent off-site for recycling. The disadvantage associated with the use of a TEA scrubber is that only the TEA emissions will be controlled. TEA scrubbers are not designed to control any of the other VOC emissions that are emitted from the partial evaporation of the binder material used in making the cores.

---

[3] Telephone conversation with Mr. Joe Fox, Ashland Chemical, on April 3, 2001. This information was also supplied to IDEM through e-mail from Mr. Joe Fox on April 4, 2001.

[4] E-mail dated April 16, 2001 from Craig Nitchman, who is a representative of Calgon Carbon.

Regenerative Incineration (RTO) - One case of the use of a RTO to control VOC emissions from core machines has been identified. Wheland Foundry in Chattanooga Tennessee received a PSD permit in November 1998 requiring them to utilize a RTO to control 98% of the VOC emissions from the core machines in their core making process. The core machines and RTO are operating, and compliance with the overall VOC limit has been demonstrated via a stack test conducted on July 31, 2000. The VOC destruction efficiency for the Wheland Foundry RTO was measured at 99.2%. Since this technology has been demonstrated to be effective for controlling VOC emissions from Isocure core machines at another iron foundry, it is considered to be technically feasible for use in controlling VOC emissions from the proposed core machines at Waupaca Foundry. It is conservatively assumed that a RTO, if utilized at Waupaca, would be capable of controlling 98% of the VOCs.

Step 3 - Rank remaining control technologies by control effectiveness

Wheland Foundry has demonstrated that the use of a RTO to control at least 98% of the VOC emissions is technically feasible. Therefore, a RTO is considered the most effective add-on control. Carbon adsorption is expected to control 98% of all of the VOCs in the gas stream, except formaldehyde. The formaldehyde emissions are expected to be less than 1% of the total VOC emissions. Therefore, the overall VOC control efficiency for carbon adsorption is expected to be just slightly less than 98%. A TEA scrubber is expected to control 98% of only the TEA emissions; therefore, it is ranked third. Waupaca proposes a 100% capture efficiency for all three options (to be achieved via total enclosure); therefore, overall control efficiency is equal to the destruction efficiency for each control option. The following table summarizes the information on the three remaining control options:

Table 2
(Ranking of Control Options for VOCs from Core Machines)

Control Device	Potential Uncontrolled VOC Emissions from core machines (with production limit of 26,000 tons cores/yr) (tons/year)				Estimated Control Efficiencies (%)				Emissions after Controls (tons/year)			
	TEA	Formaldehyde	Other VOCs	Total VOCs	TEA	Formaldehyde	Other VOCs	Total VOCs	TEA	Formaldehyde	Other VOC	Total VOC
RTO	39.00	0.026	3.97	42.97	98	98	98	98	0.78	0.00	0.08	0.86
carbon adsorption	39.00	0.026	3.97	42.97	98	0	98	97.9	0.78	0.026	0.08	0.88
TEA scrubber	39.00	0.026	3.97	42.97	98	0	0	88.9	0.78	0.026	3.94	4.75

As indicated by the information in Table 2 above, the ranking of the control devices is as follows:

(1) RTO

(2) carbon adsorption
(3) TEA scrubber

Step 4 - Evaluate the most effective controls and document results

Selection of Control Option

Waupaca completed cost analyses for all three remaining control options. The cost analyses were completed using information from the OAQPS manual and associated trade journals. The purchase cost for the TEA scrubber was based on a direct quote from a vendor. The purchase costs for the RTO and carbon adsorption systems were based on the OAQPS manual and associated trade journals, along with some specific information from vendors. Waupaca also evaluated the environmental and energy impacts of all three remaining control options. The table below summarizes the economic, environmental, and energy impacts of all three remaining control options.

Table 3
Economic, Environmental and Energy Impacts for VOC Control Options for Core Machines

Control Option	VOC Emissions After Control (tons/yr)	Emissions Reduction (tons/yr)	Overall Control Efficiency (%)	Economic Impacts		Collateral Environmental Impacts	Energy Impacts
				Total annualized cost ($/ton)	Average cost effectiveness ($/ton)		
RTO	0.86	42.11	98.0	380,738	9,041	TEA is destroyed instead of recycled	23 MMCF nat gas usage, 274 mw-hr
carbon adsorption	0.88	42.08	97.9	611,019	14,520	TEA/resin mixture must be disposed of as haz waste	6 MMCF nat gas usage, 24 mw-hr
TEA scrubber	4.75	38.22	88.9	108,354	2,835	TEA/spent scrubber solution must be periodically recycled	85 mw-hr

RTO Analysis

The major advantage in using a RTO versus a TEA scrubber is that with the RTO, 98% of all of the VOCs could be controlled, whereas a TEA scrubber would only control TEA emissions. At least one other foundry has been identified that uses a RTO to control VOC emissions from Isocure core machines. EPA's top-down BACT guidance indicates that, where a control technology has been successfully applied to similar sources in a source category, **an applicant should concentrate on documenting significant cost differences**, if any, between the application of the control technology on those sources and the particular source under review.[5] The following table compares the cost of the RTO at Wheland Foundry to the cost of the proposed RTO and Waupaca Foundry.

Table 4
Comparison of Costs Associated with Implementing BACT at other Foundries

Source	Control Selected as BACT	Economic Impacts	
		Total annualized cost ($/ton)	Average cost effectiveness ($/ton)
Waupaca Foundry, IN	RTO (proposed)	380,738	9,041
Wheland Foundry, TN	RTO	145,335	653

The cost of the RTO at Wheland Foundry was estimated to be $653 per ton of VOC removed, which is much lower than the estimated cost for installing the RTO at Waupaca Foundry. However, the Wheland Foundry analysis significantly overestimated the uncontrolled VOC emissions from the core machines, which resulted in a much lower than actual estimate of the overall cost effectiveness.[6] In order to be able to compare the actual cost of the RTO at Wheland to the estimated cost effectiveness of the proposed RTO at Waupaca Foundry, IDEM has corrected the Wheland cost analysis based on the results of their stack test. Wheland's original cost estimate also assumed only $12 per hour for labor costs, while Waupaca's included a $20 per hour labor cost. Therefore, IDEM has also revised the Wheland cost estimate using $20 per hour for labor costs. This allows a useful comparison of the true cost effectiveness of the RTO at Wheland to the cost effectiveness of the RTO at Waupaca. These corrections to the Wheland cost estimate result in a cost effectiveness of $4,928 per ton of VOC removed. (Detailed calculations are shown in Appendix A). Even with these corrections, the proposed RTO for Waupaca would have a cost effectiveness that is twice as high as the cost effectiveness for the RTO installed at Wheland.[7] The estimated cost of the RTO at Waupaca is considered cost prohibitive. No further analysis of this option is necessary.

Carbon Adsorption Analysis

IDEM has not identified any other foundries utilizing carbon adsorption for the control of VOC emissions from core machines; therefore, this control technology is considered unproven for this particular application.

---

5 Page 34

6 Wheland's analysis estimated that uncontrolled VOC emissions at the inlet to the RTO were 8.18 pounds per ton of cores, but their subsequent stack test showed that the uncontrolled VOC emissions were only 1.4 pounds per ton of core. Therefore, Wheland significantly underestimated the cost of their RTO.

7 The major differences between the two costs are due to differences in the air flows from the core machines.

Discussions with a representative of Calgon Carbon indicate that the VOCs emitted at the core machines would be captured by the carbon adsorption system.[8] However, due to the low affinity of carbon for TEA and the large amount of TEA emissions, the system would require $4,500 per day for disposal and replacement of the carbon, or approximately $1.6 million per year. This cost assumes that regeneration would be conducted off-site. Therefore if this control option were used, on-site regeneration would be necessary. Assuming the use of on-site regeneration, the carbon adsorption system is estimated to cost $14,520 per ton of VOC removed.[9] Therefore, even assuming that carbon adsorption would be technically feasible, it would not be cost effective. No further analysis of this option is necessary.

TEA Scrubber Analysis

The next most effective option is a TEA scrubber. TEA scrubbers are not designed to control the VOC emissions that will result from the partial evaporation of the binder system. However, several foundries utilize scrubbers to control the catalyst emissions from Isocure core machines. The scrubbers have been demonstrated to be very effectiveness in reducing TEA emissions. It is expected that 98% control of TEA would be achieved through the use of a TEA scrubber. Waupaca already has a TEA scrubber installed and operating to control TEA emissions from some other existing Isocure core machines at this location. Waupaca proposes to upgrade the existing TEA scrubber to control the additional TEA emissions that would be emitted from the new core machines. As a worst case scenario, Waupaca completed a cost analysis for installing a new scrubber. The overall cost effectiveness is estimated to be $2,835 per ton of VOC removed, even for a new scrubber. This cost is considered reasonable.

Conclusion of Selection of Control Options

A TEA scrubber shall be used to control TEA emissions from the core machines.

Evaluation of Capture System

Waupaca has proposed a 100% capture efficiency for all three control options evaluated. This is consistent with other recent BACT determinations for core machines for iron foundries. For example, recent BACT determinations for Golden Casting Foundry in Indiana, and Chrysler Foundry in Indiana both required 100 percent capture from the core making facilities. IDEM will require stack tests to determine compliance with the capture efficiency from the core making facility.

Evaluation of Emission Limit

Existing BACT/LAER Emission Limitations - The EPA RACT/BACT/LAER Clearinghouse (RBLC) is a database system that provides emission limit data for industrial processes throughout the United States. The following table summarizes previous BACT determinations for VOC emissions from Isocure cold-box core machines.

[8] E-mail from Craig Nitchman, who is a representative of Calgon Carbon.

[9] Information received from Advanced Recovery Technologies Corporation.

Table 5
BACT Emission Limits for VOC from Core Machines

Source Name	Total VOC limit	TEA Limit	Method of Achieving BACT Limit	Compliance Information
Waupaca's proposed limits	**0.366** lbs/ton cores (2.20 lbs/hr)	**0.06** lbs/ton	TEA scrubber	N/A
Wheland Foundry, Chattanooga, TN, Permit #3710-30400319-91I issued 11/3/98	22.04 lbs/hr, 98% overall control efficiency (equivalent to **2.2** lbs/ton cores)	1,148 tons TEA usage per year	RTO	Compliant Stack Test demonstrated 99.2% destruction efficiency for total VOC emissions
Huron Casting, Inc., Pigeon, MI, Permit #850-90, issued 6/10/91	4.1 lbs/hr (equivalent to **0.854** lbs/ton cores) and 0.51 tons/yr	no specific TEA limit	RTO	not currently in operation, no compliance information available
Waupaca Foundry, Etowah, TN Permit #54-017420 issued 4/28/00	3 lbs/hr (stack) (equivalent to 0.15 lb/ton), 15.06 lbs/hr (total stack and fugitive) (equivalent to **0.753** lbs/ton cores) and 5.50 tons per year (combined limits for both core mixing and core making)	no specific TEA limit	no controls required, source agreed to the emission limit but no method of achieving compliance is specified	no method specified for demonstrating compliance, currently under construction
Golden Casting Corporation, Columbus, IN, CP005-7081 issued 3/1/97	no specific total VOC limit, but calculations show that with the production limit, total VOC emissions would be **2.90** lbs/ton cores	1.34 lbs/hr (stack only) (equivalent to 0.103 lb/ton), 95% overall control efficiency (equivalent to **0.208** lbs/ton cores (stack and fugitive))	TEA scrubber, production limit	Compliant stack test December 16-17, 1998, results showed TEA emissions of 0.0015 lb/ton cores
Waupaca Foundry, IN, Phase 2 Operations (CP123-8451, issued 2/4/98)	**0.63** lbs/ton cores	**0.18** lbs/ton cores	TEA scrubber	Compliant stack test, May 3-8, 2000, results were 0.41 lbs VOC/ton cores and 0.015 lbs TEA/ton cores
Waupaca Foundry, IN Phase 1 Operations (permit issued 1996)	4.6 lbs/hr (equivalent to **0.288** lbs/ton cores) and 20.2 tons per year	no specific TEA limit specified	TEA scrubber	no stack test required

TEA Limit

Review of the RBLC indicates that the lowest TEA BACT limit achieved in practice from Isocure core machines

is 0.18 pounds per ton of cores. Waupaca's proposed limit of 0.06 pounds of TEA per ton of cores is lower than any other BACT limit for Isocure core machines; therefore, this limit is determined to be BACT.

Total VOC Limit

Review of the RBLC indicates that the lowest permitted VOC BACT limit achieved in practice from Isocure core machines is 0.288 pounds per ton of cores; however no stack test has ever been performed to verify compliance with this limit. The lowest VOC BACT limit demonstrated is 0.63 pounds per ton of cores. The stack test for this source revealed a VOC emission rate of 0.41 pounds per ton of cores. Waupaca's proposed limit for non-TEA VOC emissions is 0.010 pounds per pound of binder used. Waupaca has indicated that their maximum binder usage is 1.5%. As a result, the evaporative losses from the core making operations would be approximately 0.306 pounds of VOC per ton of cores produced. When added together with the TEA emissions, this would result in total VOC emissions of 0.366 pounds per ton of cores produced. This proposed limit is much lower than any other BACT limit that has been demonstrated for Isocure core machines; therefore, this limit is determined to be BACT.

Step 5 - Select BACT

VOC BACT Determination for core machines - BACT for the core machines is determined to be the use of a TEA scrubber with 100% capture efficiency and 98% destruction efficiency. TEA emissions shall not exceed 0.06 pounds per ton of cores produced. Non-TEA VOC emissions shall not exceed 0.010 pounds per pound of binder used. The BACT will also include a core production limit of 26,000 tons per 12 consecutive month period. Maximum resin usage shall be limited to 1.5% by weight, which is 390 tons per 12 consecutive month period. Compliance with the TEA emission limits will be determined by stack testing. Monthly records shall also be kept of the binder usage and core production. Reports of this information shall be submitted quarterly. A stack test for total VOC emissions will also be required. The non-TEA VOC emission limits in this permit are based on laboratory tests conducted by Ashland. Since the binder system proposed by Waupaca is a newly developed formula, there is not sufficient data on which to base a firm emission limit. Only one other foundry has utilized this new binder material, but that foundry has not yet completed any stack testing to determine the actual VOC emissions from the partial evaporation of the binder material.[10] Therefore, the permit will also include a re-opener clause that allows IDEM to adjust the non-TEA VOC emission limit based upon the results of the stack test.

BACT Analysis for VOCs and Organic HAPs from core mixers

The phenolic-urethane core mixers will generate VOC/HAP emissions by the partial evaporation of the resins during mixing with the sand. Waupaca Foundry proposes no controls as BACT for the mixers and a VOC emission limit of 0.054 pounds per ton of cores. IDEM agrees with Waupaca's proposed BACT. Although controls would be technically feasible for these operations, Waupaca has submitted cost analyses showing that all technically feasible control options would be cost prohibitive. Additionally, all prior BACT determinations specify no controls for mixing operations. The following discussion outlines the BACT analysis as proposed by Waupaca and IDEM's review of the source's BACT.

Step 1 - Identify Control Options

Control Options Identified - Four (4) available technologies were evaluated to control VOC emissions from the

[10] A new foundry, Georgia Ductile, in Cordele Georgia, that just recently began operations, has begun using this new binder system. However, no testing has been done at that facility to determine the VOC emissions from the partial evaporation of the binder system. This information was provided to IDEM in an e-mail dated April 4, 2001 from Joe Fox, who is a representative of Ashland Chemical.

core mixers:

Refrigeration
Carbon adsorption
Regenerative incineration (hereafter referred to as regenerative thermal oxidizer (RTO))
Packed bed scrubber system (hereafter referred to as triethylamine (TEA) scrubber)

Step 2 - Eliminate technically infeasible control options

Refrigeration - The OAQPS manual states that refrigeration is considered a control alternative when the VOC concentration of the gas stream exceeds 50% of the LEL and the condensed VOC is a reuseable product. Waupaca estimates that the outlet VOC concentration of the gas stream will be approximately 150 ppm or 1% of the LEL. Therefore, refrigeration is not considered a technically feasible control alternative.

Carbon Adsorption - IDEM has not identified any other foundries utilizing carbon adsorption for the control of VOC emissions from mixers; therefore, this control technology is considered unproven for this particular application. Discussions with a Calgon representative indicate that the VOCs emitted at the core machines would be captured by the carbon adsorption system. Therefore, even though this technology has not been proven for this particular application, it is considered to be possibly technically feasible, based on discussions with Calgon Carbon and Advanced Recovery Technologies Corporation.[11]

TEA scrubber - TEA scrubbers are not designed to control any VOC emissions that are emitted from the use of the binder material in making the cores. No TEA emissions will be emitted from the mixers; therefore a TEA scrubber is not technically feasible.

Regenerative Incineration (RTO) - IDEM has not identified any other foundries utilizing a RTO for the control of VOC emissions from mixers; therefore, this control technology is considered unproven for this particular application. However, the VOC emissions from the mixers will be similar in nature to the VOC emissions from the core machines. Since a RTO has been proven to be effectiveness in controlling VOC emissions from core machines, it is logical that it could also be effective in controlling VOC emissions from the mixers. Therefore, even though this technology has not been proven for this particular application, it is considered to be technically feasible,

Step 3 - Rank remaining control technologies by control effectiveness

The RTO will control 98% of all the VOC emissions. The carbon adsorption system will control 98% of all the VOCs except formaldehyde. Therefore, the RTO is considered the most effectiveness option. There is little information available to estimate the percentage of formaldehyde in the emission stream. Therefore, in order to generate the most conservative cost analysis, Waupaca assumed that the carbon adsorption system would also control 98% of all the VOCs. Waupaca then submitted cost analyses for both options. The cost information is summarized in the following table.

Table 6
Costs of Control Options

Control	VOC's After Controls	Total VOCs Reduced	Economic Impacts

[11] Both of these companies design carbon adsorption system.

			Total annualized cost ($/year)	Average cost effectiveness ($/ton)
RTO	0.01	0.64	388,449	609,810
carbon adsorption system	0.01	0.64	103,143	161,920

Step 4 - Evaluate the most effective controls and document results

As shown in Table 6 above, neither the RTO nor the carbon adsorption system would be cost effective. No further evaluation of controls is necessary.

Evaluation of Emission Limit

Existing BACT/LAER Emission Limitations - The EPA RACT/BACT/LAER Clearinghouse (RBLC) is a database system that provides emission limit data for industrial processes throughout the United States. The following table summarizes previous BACT determinations for VOC for Isocure cold-box core mixers.

Table 7
BACT Emission Limits for VOC from Mixers

Source Name	Total VOC limit	Method of Achieving BACT Limit	Compliance Information
Waupaca's proposed limits	0.054 lbs/ton cores (limit on core machines is 0.366 lbs/ton for a total of 0.42 lbs/ton for core machines and core mixers)	no controls for mixers	N/A
Huron Casting, Inc., Pigeon, MI, Permit #850-90, issued 6/10/91	0.854 lbs/ton cores and 0.51 tons/yr (combined limits for both core mixing and core machines)	no controls for mixers	not currently in operation, no compliance information available
Waupaca Foundry, Etowah, TN Permit #54-017420 issued 4/28/00	0.76 lb/ton cores (combined limits for both core mixing and core machines)	no controls required, source agreed to the emission limit but no method of achieving compliance is specified	no method specified for demonstrating compliance, currently under construction
Golden Casting Corporation, Columbus, IN, CP005-7081 issued 3/1/97	no limits on mixers	no controls for mixers, production limit for coremaking process	N/A
Waupaca Foundry, IN, Phase 2 Operations (CP123-8451, issued 2/4/98)	0.63 lbs/ton cores (combined limits for both core mixing and core machines)	no controls for mixers	Compliant stack test
Waupaca Foundry, IN Phase 1 Operations (permit issued 1996)	0.29 lb/ton cores (limit specified for core manufacturing)	no controls for mixers	no stack test required

IDEM has not identified any PSD permits that specify VOC limits for mixers. Most PSD permits state a combined limit for the mixers and the core machines. Waupaca's proposed limit for the mixers is 0.002 pounds per pound of binder used, which is equivalent to 0.054 pounds per ton of cores. Combining the limits for the mixer and the core machines results in a total of 0.42 pounds per ton of cores. Review of the RBLC indicates that the lowest VOC BACT limit from Isocure core mixers and core machines combined is 0.63 pounds per ton of cores. Only Waupaca's previous PSD permit includes a lower limit, which is 0.29 pounds per ton of cores. However, Waupaca has not conducted a stack test to demonstrate compliance with this limit. Therefore, Waupaca's proposed VOC limit of 0.002 pounds per pound of binder used for the mixers is determined to be BACT.

Step 5 - Select BACT

VOC BACT Determination for mixers - BACT for the mixers is determined to be no controls. Total VOC emissions shall not exceed 0.002 pounds per pound of binder used. Compliance with this limit shall be

demonstrated by complying with a binder usage limit. A stack test will also be required. The emission limits in this permit are based on laboratory tests conducted by Ashland. Since the binder system proposed by Waupaca is a newly developed formula, there is not sufficient data on which to base a firm emission limit. Only one other foundry has utilized this new binder material, but that foundry has not yet completed any stack testing to determine the actual VOC emissions from partial evaporation of the binder material. Therefore, the permit will also include a re-opener clause that allows IDEM to adjust the emission limits based upon the results of the stack test.

BACT Analysis for PM/PM10 from core sand handling system

As part of this project, Waupaca will expand the core sand handling system. The maximum capacity will increase from 20 tons of sand per hour to 26 tons of sand per hour. The core sand handling system will generate PM/PM10 emissions from handling the core sand prior to the point where it is mixed with the resin. Waupaca Foundry proposes to upgrade the existing baghouse as BACT for the core sand handling system. Waupaca proposes a PM/PM10 emission limit of 0.005 gr/dscf. IDEM agrees with Waupaca's proposed BACT. The following discussion outlines the BACT analysis as proposed by Waupaca and IDEM's review of the source's BACT.

Step 1 - Identify Control Options

Control Options Identified - Two (2) available technologies were evaluated to control PM/PM10 emissions from the core sand handling system:

Baghouse
High energy venturi scrubber system

Step 2 - Eliminate technically infeasible control options

Both options are considered technically feasible.

Step 3 - Rank remaining control technologies by control effectiveness

Baghouse technology has been used extensively in the foundry industry to control particulate emissions, achieving outlet concentrations of 0.01 gr/dscf and less. Scrubber systems are also in use but are generally less effective for controlling particulate emissions. The baghouse is considered to be the most effective option.

Step 4 - Evaluate the most effective controls and document results

Evaluation of Emission Limit

Existing BACT/LAER Emission Limitations - The EPA RACT/BACT/LAER Clearinghouse (RBLC) is a database system that provides emission limit data for industrial processes throughout the United States. The RBLC contains numerous entries for foundry operations controlling PM/PM10 emissions. The following table summarizes the more stringent previous BACT determinations for PM/PM10 emissions for foundry operations.

Table 8
BACT Emission Limits for PM/PM10 from Foundry Operations

Source Name	Total PM/PM10 limit	Control Specified	Compliance Information
Waupaca's proposed limits	0.005 gr/dscf (equivalent to 0.02 lb/ton of core sand)	baghouse (proposed)	N/A
Waupaca Foundry, Waupaca, WI Permit #99-RV-009 issued 07/16/99	0.005 gr/ascf Note: In this permit 18 different baghouses were required to comply with the 0.005 gr/acf PM/PM10 limit. The various baghouses controlled pouring, cooling, shakeout, sand handling, and finishing operations;	baghouses	Compliant
Waupaca Foundry, Etowah, TN Permit #54-017420 issued 4/28/00	0.005 gr/dscf Note: In this permit 10 different baghouses were required to comply with the 0.005 gr/dscf PM/PM10 limit. The various baghouses controlled pouring, cooling, shakeout, sand handling, ductile iron treatment stations, and finishing operations;	baghouses	Currently under construction
Waupaca Foundry, IN, Phase 2 Operations (CP123-8451, issued 2/4/98)	0.005 gr/dscf Note: In this permit 34 different baghouses were required to comply with the 0.005 gr/dscf PM/PM10 limit. The various baghouses controlled pouring, cooling, shakeout, sand handling, ductile iron treatment stations, and finishing operations;	baghouses	Compliant stack test, May 3-8, 2000, results ranged from 0.00031 gr/dscf to 0.03 gr/dscf. The test results for the baghouse controlling the core sand handling system results were 0.003 gr/dscf
Waupaca Foundry, IN Phase 1 Operations (permit issued 1996)	core sand handling system PM/PM10 limit 1.29 lbs/hr (equivalent to 0.081 lbs/ton core sand)	baghouse	Compliant

Review of the RBLC indicates that the lowest permitted PM/PM10 BACT limit achieved in practice at a foundry operation is 0.005 gr/dscf (equivalent to 0.081 lbs/ton of core sand) at the same Waupaca Foundry Plant, for it's Phase 1 operations. Waupaca's proposed limit of 0.005 gr/dscf is equivalent to 0.02 pounds per ton of core sand. The limit expressed both in grains per dry standard cubic foot of exhaust air, and as pounds per ton of core sand, is equal to or lower than any other limit for any similar foundry operation. Therefore, this limit is determined to be BACT.

Step 5 - Select BACT

PM/PM10 BACT Determination for core machines - BACT for the core sand handling system is determined to be a baghouse with an outlet grain loading of 0.005 gr/dscf. This is equivalent to 0.02 pounds per ton of core sand.

Appendix C
Air Quality Analysis

Introduction

Waupaca Foundry has applied for a permit to increase capacity of their core sand handling and coreroom operation and a permit to increase the capacity of their ductile iron treatment process near Tell City in Perry County, Indiana. The site is located at Universal Transverse Mercator (UTM) coordinates 520200 East and 4204000 North. Perry County is designated as attainment for the National Ambient Air Quality Standards. These standards for NO2, SO2, CO and PM10 are set by U.S. EPA to protect the public health and welfare.

The permit applications were received by the Office of Air Quality (OAQ) on August 3, 2000 and October 21, 1999. This document provides OAQ's Air Quality Modeling Section's review of both permit applications including an air quality analysis performed by the OAQ.

Air Quality Analysis Objectives

The OAQ review of the air quality impact analysis portion of the permit application will accomplish the following objectives:

A. Establish which pollutants require an air quality analysis based on the source's emissions.
B. Determine the ambient air concentrations of the source's emissions and provide analysis of actual stack height with respect to Good Engineering Practice (GEP).
C. Demonstrate that the source will not cause or contribute to a violation of the National Ambient Air Quality Standard (NAAQS) or Prevention of Significant Deterioration (PSD) increment.
D. Perform an analysis of any air toxic compound for the health risk factor on the general population.
E. Perform a brief qualitative analysis of the source's impact on general growth, soils, vegetation and visibility in the impact area with emphasis on any Class I areas. The nearest Class I area is Kentucky's Mammoth Cave National Park which is 95 kilometers from the proposed modification in Perry County, Indiana.

Summary

Waupaca Foundry has applied for a construction permit to modify their facility, near Tell City in Perry County, Indiana. The application was prepared by Wingra Engineering of Madison, WI. Perry County is currently designated as attainment for all criteria pollutants. The permit is PSD for Particulate Matter, Lead, Beryllium, and Volatile Organic Compounds (VOC's). Modeling results taken from the Industrial Source Complex Short Term (ISCST3) model showed that for all pollutants impacts were predicted to be less than the significant impact increments and significant monitoring de minimus levels. OAQ conducted Hazardous Air Pollutant (HAPs) modeling and all HAP 8-hour maximum concentrations modeled below 0.5% of each Permissible Exposure Limit (PEL). There was no impact review conducted for the nearest Class I area, which is Mammoth Cave National Park in Kentucky, due to the modeled concentrations from the source falling below significant impact increments. An additional impact analysis on the surrounding area was conducted and showed no significant impact on economic growth, soils, vegetation, federal and state endangered species or visibility from the proposed facility.

Part A - Pollutants Analyzed for Air Quality Impact

Indiana Administrative Codes (326 IAC 2-2) PSD requirements apply in attainment and unclassifiable areas and require an air quality impact analysis of each regulated pollutant emitted in significant amounts by a new major stationary source or modification. Significant emission levels for each pollutant are defined in 326 IAC 2-2-1. Waupaca Foundry will emit Pb, Be, VOC (ozone) and PM_{10} in excess of their significant emission rates as shown in Table 1.

TABLE 1 - Waupaca's Emission Rates (tons/yr)*		
Pollutant	**Maximum Allowable Emissions**	**Significant Emission Rate**
Be	.0025	.0004
Pb	.6	.6
PM_{10}	131.2	15.0
VOC	165.4	40.0

***** Including theoretical increases. Theoretical increases would be possible emissions increase due to the higher processing rates. However, only permitted potential increases were modeled.

Significant emission rates are established to determine whether a source is required to conduct an air quality analysis. If a source exceeds the significant emission rate for a pollutant, air dispersion modeling is required for that specific pollutant. A modeling analysis for each pollutant is conducted to determine whether the source modeled concentrations would exceed significant impact increments. Modeled concentrations below significant impact increments are not required to conduct further air quality modeling. Modeled concentrations exceeding the significant impact increment would be required to conduct more refined modeling which would include source inventories and background data.

Part B - Significant Impact Analysis

An air quality analysis, including air dispersion modeling, was performed to determine the maximum concentrations of the source emissions on receptors outside of the facility property lines. Long-term (annual) worst-case determinations were based on the permit limits of operation per year using natural gas or diesel-firings. Stack parameters were based on peak-summer demand conditions.

Model Description

The Office of Air Quality review used the Industrial Source Complex Short Term (ISCST3) model, dated April 10, 2000 to determine maximum off-property concentrations or impacts for each pollutant. All regulatory default options were utilized in the United States Environmental Protection Agency (U.S. EPA) approved model, as listed in the 40 Code of Federal Register Part 51, Appendix W "Guideline on Air Quality Models". The model also utilized the Schulman-Scire algorithm to account for building downwash effects. Stacks associated with the proposed modification are below the Good Engineering Practice (GEP) formula for stack heights. This indicates that wind flow over and around surrounding buildings can influence the dispersion of pollutant coming from the stacks. 326 IAC 1-7-3 requires a study to demonstrate that excessive modeled concentrations will not result from stacks with heights less than the GEP stack height formula. These aerodynamic downwash parameters were calculated using U.S. EPA's Building Profile Input Program (BPIP).

Meteorological Data

The meteorological data used in the ISCST3 model consisted of surface data from the Evansville National Weather Service station merged with the mixing heights from Peoria, Illinois. National Weather Service Station for the five-year period (1990-1994). The 1990-1994 meteorological data was purchased through the National Oceanic and Atmospheric Administration (NOAA) and National Climatic Data Center (NCDC) and preprocessed into ISCST3 format with an updated version of U.S. EPA's PCRAMMET program.

Modeled Results

Maximum modeled concentrations for each pollutant over its significant emission rate are listed below in Table 2 and are compared to each pollutant's significant impact increment for Class II areas, as specified by U.S. EPA.

TABLE 2 - Summary of OAQ's Significant Impact Analysis (ug/m3)

Pollutant	Year	Time-Averaging Period	Waupaca Maximum Modeled Impacts	Significant Impact Increments	Significant Monitoring Increments
Beryllium	1990	24-hour	0.00000	**N/A**	[a]
Beryllium	1990	Annual	0.00000	**N/A**	[a]
Lead	1993	3-month	0.00000	**N/A**	0.1
PM_{10}	1993	24-hour	1.18	**5.0**	10.0
PM_{10}	1991	Annual	0.14	**1.0**	[a]

[a] No limit exists for this time-averaged period

All modeled concentrations for each pollutant at all applicable time-averaged periods were below both the significant impact increment and significant monitoring de minimus levels. No significant short-term or long-term health impacts are expected as a result of the proposed facility and no further refined air quality analysis is required as well as no pre-construction monitoring requirements.

Particulate Matter less than 2.5 micron

EPA issued a new National Ambient Air Quality Standards for Particulate Matter less than 2.5 microns ($PM_{2.5}$) on July 17, 1997. Due to a legal challenge to the new standard, however U.S. EPA has released specific guidance stating that states should continue to analyze PM10 impacts for all New Source Review. There are 3 primary origins of $PM_{2.5}$: 1) primary particulates in the solid state, 2) condensable particulates and 3) secondary particulates formed through atmospheric reactions of gaseous precursor emissions. There will be a five-year scientific review of this standard which includes installation of $PM_{2.5}$ monitors throughout the state to better define background concentrations and gather source specific information. EPA is expected to release a new dispersion model to better predict $PM_{2.5}$ concentrations. There are no assumed ratio of $PM_{2.5}$ to PM_{10} at this time. As more information becomes available, a more detailed analysis of $PM_{2.5}$ can be conducted.

Part C - Ozone Impact Analysis

Ozone formation tends to occur in hot, sunny weather when NOx and VOC emissions photochemically react to form ozone. Many factors such as light winds, hot temperatures and sunlight are necessary for higher ozone production. The results of the wind rose analysis and the puff transport model show that any potential plume emitted from the facility would fall out to the northeast and relatively close to the facility.

OAQ Three-Tiered Ozone Review

OAQ incorporates a three-tiered approach in evaluating ozone impacts from a single source. The first step is to determine how NOx and VOC emissions from the new source compare to area-wide NOx and VOC emissions. Results from this analysis show Waupaca's limited VOC emissions of 90.9 pounds/day would comprise less than 0.02% of the area-wide VOC emissions from point, area, onroad and nonroad mobile source and biogenic emissions.

A second step is to review historical monitored data to determine ozone trends for an area and the applicable monitored value assigned to an area for designation determinations. This value is known as the design value for an area. The nearest ozone monitors within this region are the upwind monitors in Warrick County. The design value for the Boonville monitor is 116 ppb for the 1-hour ozone standard. Wind rose analysis indicates that prevailing winds in the area occur from the southwest and west-southwest during the summer months of May through September when ozone formation is most likely to occur. Ozone impacts from the Waupaca proposed facility would likely fall north, northeast and east northeast of the facility, generally away from the existing ozone monitors in the Evansville region and would likely impact north of the Louisville region.

A third step in evaluating the ozone impacts from a single source is to estimate the source's individual impact through a screening procedure. The Reactive Plume Model-IV (RPM-IV) has been utilized in the past to attempt to determine 1-hour ozone impacts from single VOC/NOx source emissions. However, the lack of supporting documentation and availability of meteorological data and ambient background concentrations makes this methodology extremely difficult to utilize and results can be suspect. The model is unable to simulate all meteorological and chemistry conditions present during an ozone episode (period of days when ozone concentrations are high). Modeling for 1 hour ozone concentrations was conducted for August 22, 1998 (a high ozone day) to compare the results to the ozone National Ambient Air Quality Standard (NAAQS) limit. The maximum cell concentration for each time and distance specified was used to compare to the ambient ozone mode. OAQ modeling results assumed the short-term emission rates of NO_2 and VOCs and are shown in Appendix C. The impact (difference between the plume-injected and ambient modes) from Waupaca Foundry was 4.1 ppb. All ambient plus plume-injected modes were below the NAAQS limit for ozone at every time period and every distance.

Urban Airshed Model (UAM) analysis for regional ozone transport has been conducted by OAQ as well as states surrounding Lake Michigan and various national organizations. UAM is regarded as a regional modeling tool used to develop ozone attainment demonstrations and determine NOx and VOC emission controls for a region. Transport of ozone and ozone-forming pollutants from upwind areas is evident and likely contribute to increased ozone concentrations in Perry County. Previous experience with this model has shown that the amount of additional VOC emissions from Waupaca Foundry, which are a tiny fractions of the pollutants regionally, would not noticeably increase the ozone concentrations in the area.

From this three-tiered approach, ozone formation is a regional issue and the emissions from Waupaca Foundry will represent a small fraction of NOx and VOC emissions in the area. Ozone contribution from Waupaca Foundry emissions is expected to be minimal. Ozone historical data shows that the area monitors have design values below the ozone NAAQS of 125 ppb and the Waupaca Foundry ozone impact based on the emissions and modeling will have minimal impact on ozone concentrations in the area.

Table 3 - RPM-IV Modeling for Waupaca Foundry				
NAAQS Analysis for Ozone (June 6, 1995)				
Time	**Distance**	**Ambient**	**Plume-Injected**	**Source Impact**
(hours)	(meters)	(ppb)	(ppb)	(ppb)
700.0	100	50	33	-17
800.0	9352	46.8	50.9	4.1
900.0	20476	56.5	58.3	1.8
1000.0	31600	70.5	71.9	1.4
1100.0	40852	82.6	83.2	0.6
1200.0	50104	92.1	92.6	0.5
1300.0	59356	99.2	99.2	0.0
1400.0	68608	103	102	-1.0
1500.0	77860	105	103	-2.0
1600.0	87112	107	104	-3.0

Part E - Hazardous Air Pollutant Analysis and Results

OAQ presently requests data concerning the emission of 188 Hazardous Air Pollutants (HAPs) listed in the 1990 Clean Air Act Amendments which are either carcinogenic or otherwise considered toxic and may be used by industries in the State of Indiana. These substances are listed as air toxic compounds on the State of Indiana, Department of Environmental Management, Office of Air Quality's construction permit application Form Y. Any one HAP over 10 tons/year or all HAPs with total emissions over 25 tons/year will be subject to toxic modeling analysis. The modeled emissions for each HAP are the total emissions, based over 8760 hours per year. The resulting concentrations from the limited HAP emission are less than the total HAP emissions, based on permitted limits of operation over a year. For conservative purposes, the total emissions were modeled and the maximum concentrations were used.

OAQ performed HAP modeling using the ISCST3 model for all HAPs. Maximum 8-hour concentrations were determined and the concentrations were recorded as a percentage of each HAP Permissible Exposure Limit (PEL). The PELs were established by the Occupational Safety and Health Administration (OSHA). In Table 4 below, the results of the HAP analysis with the emission rates, modeled concentrations and the percentages of the PEL for each HAP are listed. All HAPs concentrations were modeled below 0.5% of their respective PELs. The 0.5% of the PEL represents a safety factor of 200 taken into account when determining the health risk of the general population.

TABLE 4 - HAPS Analysis				
Hazardous Air Pollutants	**HAP Emissions**	**Maximum 8-hour concentrations**	**PEL**	**Percent of PEL**
	(Tons/year)	(ug/m3)	(ug/m3)	(%)
Triethylamine(TEA)	4.70000	0.009400	100000	0.0000001
Antimony	0.00030	0.000001	500	0.0000000
Arsenic	0.00000	0.000000	10	0.0000000
Beryllium	0.0000040	0.000000	2	0.0000000
Cadmium	0.00000	0.000000	5	0.0000000
Cumene	0.70000	0.001400	245000	0.0000000
Cobalt	0.00010	0.000000	100	0.0000000
Copper	0.00350	0.000007	N/A	N/A
Lead	0.00110	0.000002	50	0.0000000
Manganese	0.01730	0.000035	5000	0.0000000
Napthalene	0.70000	0.001400	50000	0.0000000
Nickel	0.00060	0.000001	1000	0.0000000
Phenol	0.70000	0.001400	19000	0.0000001
Selenium	0.00000	0.000000	200	0.0000000
Trimethylbenzene	7.70000	0.015400	750000	0.0000000
Xylene	2.00000	0.004000	435000	0.0000000

[a] No OSHA PEL for 8-hour exposure exists at this time

Part F - Additional Impact Analysis

PSD regulations require additional impact analysis be conducted to show that impacts associated with the facility would not adversely affect the surrounding area. An analysis on economic growth, soils, vegetation and visibility and is listed below.

Economic Growth and Impact of Construction Analysis

Any commercial growth, as a result of the proposed modification, is not expected to occur. A minimal number of support facilities will be needed. There will be no adverse impact in the area due to industrial, residential or commercial growth.

Soils Analysis

Secondary NAAQS limits were established to protect general welfare which includes soils, vegetation, animals and crops. Soil types in Perry County are predominately Zanesville, Gilpin, Montevallo association. The general landscape consists of Crawford Upland or flat to gently rolling terrain (1816 - 1966 Natural Features of Indiana - Indiana Academy of Science). According to the low modeled PM10 concentrations and the insignificant modeled concentrations Lead, Beryllium, and PM10 along with the HAPs analysis, the soils will not be adversely affected by the proposed modification.

Vegetation Analysis

Due to the agricultural nature of the land, vegetation in the Perry County area consists mainly of crops such as corn, wheat, oats, soybeans and hay. The maximum modeled concentrations of the proposed modification for Lead, Beryllium, and PM_{10} are well below the threshold limits necessary to have adverse impacts on surrounding vegetation (Flora of Indiana - Charles Deam). Federally endangered or threatened plants as listed in the U.S. Fish and Wildlife Service , Division of Endangered Species for Indiana list no threatened or endangered species of plants or animals. Trees in the area are considered hardy trees and due to the insignificant modeled concentrations, no significant adverse impacts are expected.

Federal and State Endangered Species Analysis

Federally endangered or threatened species as listed in the U.S. Fish and Wildlife Service , Division of Endangered Species for Indiana include 12 species of mussels, 4 species of birds, 2 species of bat and butterflies and 1 specie of snake. The state of Indiana's list of endangered, special concern and extirpated nongame species, as listed in the Department of Natural Resources, Division of Fish and Wildlife, contains species of birds, amphibians, fish, mammals, mollusks and reptiles which may be found in the area of Waupaca's proposed facility. However, the project is not expected to have any additional adverse effects on the habitats of these species.

Additional Analysis Conclusions

The nearest Class I area to the proposed modification facility is the Mammoth Cave National Park located approximately 100 km to the south in Kentucky. The impact of the operation of the proposed at this Class I area is shown below in Table 5.

Table 5
Impacts on Class 1 Areas

Pollutant	Year	Time-Averaging Period	Impacts on Mammoth Cave
Beryllium	1990	24-hour	0.00000
Beryllium	1990	Annual	0.00000
Lead	1993	3-month	0.00000
PM_{10}	1994	24-hour	0.0041
PM_{10}	1992	Annual	0.009

The results of the additional impact analysis conclude the Waupaca Foundry's proposed modification facility will have no adverse impact on economic growth, soils, vegetation, endangered or threatened species or visibility on any Class I area.